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COMPUTERWORLD

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Users may lose whether Lotus wins in court or not. Page 8.

Lower-priced AS/400s — at least one of which will run the System/36 operating system in native mode — are among the sweeteners IBM is planning to bolster AS/400 migration. Page 27.

Robert Tinker's vision of children as scientists who are able to tackle real-world problems earns accolade for its contributions to science. Page 18.

Weather system storm brews

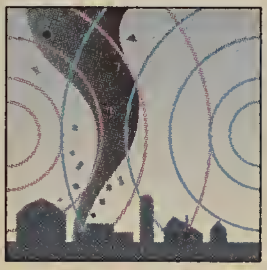
Promise of high-tech radar station clouded by pressure from critics

BY JIM NASH
CW STAFF

It started as a low, bass rumble and grew to a shaking roar. That noise, made by an approaching wall of water, was the only warning anyone in Shadyside, Ohio, received before last month's flash flood.

The principle behind how noise changes when its source — in this case, the flood — approaches the listener is called the Doppler effect. That same principle has been used for years in research radar stations to dissect storms and gauge their power. Analyzed by powerful mainframes, traces of the effect may eventually offer people 30 minutes' warning of danger with a 90% accuracy rate.

Later this summer, the U.S. government plans to power up its first operational Doppler-based radar station. The Twin Lakes, Okla., installation will be the first of 175 facilities worldwide that will steal secrets from nature. Unisys Defense Systems was named the prime contractor in 1987 for the $420 million task of marrying Doppler radar with 32-bit multiprocessor computers running at a speedy 33 million instructions per second.



However, WSR-88D — which stands for "weather surveillance radar-1988, Doppler" — would be utterly useless at detecting the storm of controversy surrounding it. Critics of the program have attacked it from all sides, offering the following complaints:

- Meteorologists said they doubt government claims that Doppler radar has a 230-km range. Some cited a recent

Continued on page 131

Defense giant pulls Profs plug

BY JEAN S. BOZMAN
CW STAFF

LONG BEACH, Calif. — Someone decided to turn off Douglas Aircraft Co.'s IBM Profs mainframe electronic mail system early last Thursday morning as an austerity measure — and employees at the besieged $4.7 billion subsidiary of McDonnell Douglas Corp. are hopping mad.

"We're stepping back seven years," said one employee at the parent company's headquarters in St. Louis. "We simply don't have the secretarial and clerical people to support us. We rely on Profs as a tool."

Profs, or Professional Office System, is being shut down as part of an cost-cutting plan that seeks to save $700 million for the $14.5 billion McDonnell Douglas by January 1991. Douglas Aircraft's Profs system linked 22,000 of the subsidiary's 47,000 employees. "Seven hundred million is a very big number," Douglas Aircraft spokesman Don Hanson said. "You've

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Outsource deal bulls through Merrill Lynch telecom group

BY ELISABETH HORWITT
CW STAFF

NEW YORK — One year after signing a $150 million network outsourcing contract with MCI Communications Corp., Merrill Lynch & Co. is reporting smooth network operations, good relations with its carrier and significant cost savings. However, the investment giant has achieved all this at the cost of dismantling its telecommunications department.

Many key networking executives, including former director of telecommunications Robert Niebanck, have departed. While some of the losses were deliberate downsizing measures, a significant number of vital managers left because they felt the outsourcing arrangement gave them little or no future at the company.

During the past year, Merrill Lynch has been involved in a struggle to balance conflicting network priorities. It has tried to cut costs without sacrificing network service quality and cut staff without losing too many key people. At the crux of this balancing act is the question of how much of its network operations the investment company can safely farm out to vendors and how much must remain in-house, sources within the company said.

By deciding not to go through with a $50 million contract to outsource all of its network management operations to MCI and IBM, Merrill Lynch lost the chance to downsize its networking organization by transferring about 50 staff members to MCI and IBM and retaining only 20.

Continued on page 4

Is there a place for Sun in 'open' DEC?

BY MARYFRAN JOHNSON
CW STAFF

BOSTON — Digital Equipment Corp. opened the Decworld '90 show last week with a siren song of open "plug-and-play" multivendor networks, while also putting a new marketing spin on client/server computing.

Underlying the usual marketing hoopla was a repackaged corporate strategy that stressed the minicomputer's emerging role as a network server to "client" personal computers and workstations. DEC officials also spelled out their plans to pull a variety of competing computer systems under their own "open" network architecture umbrella.

Yet there is a catch for Unix-based users: The umbrella will comply with standards blessed by the Open Software Foundation in Cambridge, Mass., a group that counts DEC, IBM and Hewlett-Packard Co. among its weightiest members.

Notably absent is the No. 1 workstation vendor, Sun Microsystems, Inc., which has systems in place at a large percentage of VAX sites nationwide. Can DEC establish a truly open, multivendor network that excludes Sun workstations?

Users working on both DEC and Sun systems — as well as company officials on both sides — vehemently insist that this will not happen.

"DEC and Sun are already supporting a number of the same standards," said Kevin Oberman, network manager of the engineering department at

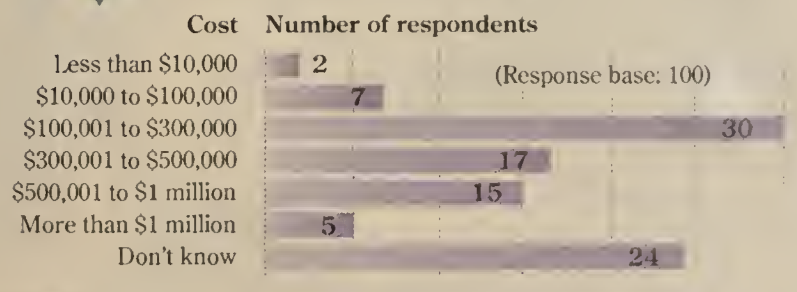
Continued on page 133

COMPUTERWORLD BUYERS' SCORECARD

Cheaper than expected

Most users say it cost $100,000 to $300,000 to get their commercial executive information system packages up and running – while many consultants say it should cost $300,000 to $500,000 or more

For product ratings, see Buyers' Scorecard, page 88



NEWSPAPER

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Quotable

"This case is a flagrant example of the Trojan Horse technique by which small, creative American companies are being controlled, then swallowed up by large Japanese concerns."

JOSEPH ALIOTO
ATTORNEY

On charges by Stardent executive Allen H. Michels that Kubota Ltd. forced a bad merger. See story page 132.

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Viral notes on this Monday after Friday the 13th: About 13% of Japanese organizations polled recently said they've been afflicted with viruses. Also, 92% of those 13% said the bugs had hit Macintosh systems . . . A Japanese ministry chose last Friday to hold its first workshop on virus prevention. The ministry's goal is to develop hacker-resistant programs . . . Netware Users International last week found a Jerusalem B computer virus in one Netware site. The virus entered through a non-Novell DOS program and was designed to delete programs last Friday. Look on the bright side: The next Friday the 13th isn't until September 1991.

How much systems support do telecommuters receive? Telecommuters and IS managers say it ranges from a ton to some to none. Page 43.

Scrutinizing the U.S.' and Soviet Union's software copyright approaches. Page 95.

EXECUTIVE BRIEFING

■ **Outsourcing is not for the faint of heart,** judging from Merrill Lynch's experience. One year after the financial services firm farmed out most of its telecommunications operation, officials say cost savings have been on target — but a lot of good people have left, and the company is fighting an ongoing battle to avoid handing too much control to the contractor. **Page 1.**

■ **Every vendor wants a piece of the EIS market,** and that poses problems for IS managers. With everything from 4GLs to graphical interfaces being hawked as executive support tools, implementors need to ask questions about how much use the system will get, how much they want to spend and what impact they expect on the business. You can build it yourself, slap a front end on a database or spend $100,000 for a custom package, with pros and cons to each approach. The two largest selling EIS packages get high satisfaction ratings from their customers. **Stories begin page 79.**

■ **CIOs are finding themselves** in positions of unaccustomed influence, according to an Input, Inc. report. A survey found that top issues for CIOs in the future will be integrating business and technology; education and communication; and supporting business goals. **Page 67.**

■ **Mitch Kapor and others** vow to protect computer users from violation of their constitutional rights but back away from calling their newly christened Electronic Frontier Foundation a "hacker defense fund." **Page 6.**

■ **The government is dissuading vendors** from developing better security systems by not letting them sell those products abroad, industry leaders say. Officials at some major vendors are urging the government to ease its restrictions. **Page 7.**

■ **Douglas Aircraft Co. pulls the plug** on its Profs system, leaving 22,000 employees without their accustomed E-mail. A drive for cost savings is cited as the reason, but some employees say the move is penny-wise and pound-foolish. **Page 1.**

■ **Goal Systems admits** that its Runtrac product infringes on Computer Associates copyrights and promises to move users smoothly to a clean version. **Page 8.**

■ **DEC stresses peaceful coexistence** with other vendors as Decworld '90 opens. It's also increasingly pushing the VAX as a network server. But openness may not be so simple for some Unix users, particularly if they have Sun equipment. **Page 1.**

■ **IBM leaves the ATM business — sort of.** It sells its ATM products and service business to onetime competitor Diebold, Inc. but also enters into a joint venture with Diebold to develop new banking products. **Page 4.**

■ **IBM and 3Com** will develop a scheme for managing central devices on mixed Token-Ring and Ethernet networks. Users say the standard is needed, but the effort may lack some key vendor support. **Page 8.**

■ **Sears serves notice** that EDI will be a requirement for doing business for its 5,000 suppliers. Partners praise the firm's even-handedness in issuing the mandate. **Page 132.**

■ **On-site this week:** Harcourt Brace Jovanovich enlists CASE tools to build a bread-and-butter mainframe application from scratch. **Page 34.** It's IS on the run for those who are setting up systems for the Goodwill Games, expecting to tear them down two weeks later. **Page 31.** LaQuinta Motor Inns managers are sleeping easier since they scrapped proprietary minicomputers in favor of Unix-based PCs. **Page 45.** CBS hopes T1 plans will save it from the embarrassment of no-soap television. **Page 53.**

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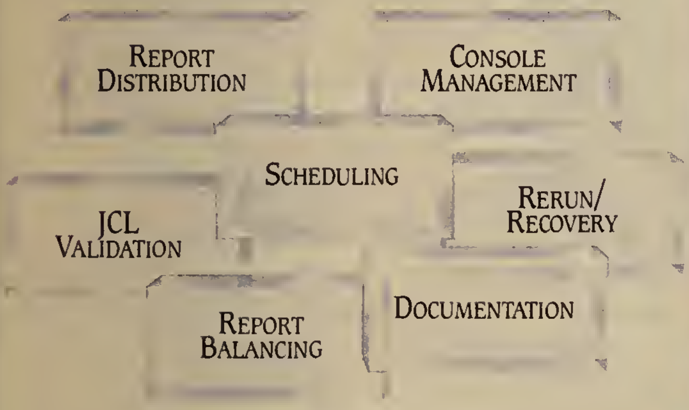

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IBM, Diebold strike ATM deal

BY ELLIS BOOKER
CW STAFF

IBM deposited some cash last week in a joint venture to develop future "self-service banking systems" for the world market while withdrawing from the maintenance side of the automated teller machine (ATM) business.

IBM said it would sell certain portions of its National Service Division, including existing ATM service agreements and service parts, to ATM vendor Diebold, Inc., which will take over support of IBM's installed base in the U.S.

At the same time, IBM and Canton, Ohio-based Diebold signed an agreement to form a joint-venture firm. The new firm, of which Diebold will be the majority owner, will market both lines of ATMs. But the "principal function" of the firm, the firms said, will be to develop new ATM products. These will include applications systems and hardware for ATMs, as well as information stations that let customers access their accounts.

Terms of the two agreements were not disclosed. However, analysts placed IBM, a player in the ATM market for two decades, third behind market leader NCR Corp. and Diebold, adding that IBM's systems had not sold well.

"ATMs are a drop in the bucket. They don't mean anything to [IBM]," said Spensor Nilson, publisher of *Nilson Report*, a trade publication in Santa Monica, Calif. Nilson ranked NCR as the top vendor in the field, selling 15,800 units worldwide last year. He said that in 1989, Diebold sold 7,301 units, while IBM sold 2,955. ATMs have an average cost of about $30,000 each, he said.

According to a Diebold spokeswoman, the company had 12% of all ATM shipments internationally and 39% of all U.S. shipments last year.

For U.S. sales, Diebold and the joint venture company will market the combined IBM/Diebold product line. Internationally, IBM will market the systems.

Diebold, which will pick up assets of IBM's National Service Division as well as ATM maintenance agreements and parts inventories, said the transaction will increase its customer service revenue by 10%.

Diebold President and Chief Operating Officer Robert P. Barone was named chief executive officer of the new company, which will also be based in Canton. The partner companies said they expect the transaction to be completed in the second half of 1990.

Merrill

FROM PAGE 1

However, the firm has effectively outsourced the responsibilities of its telecommunications division to MCI under a $150 million contract signed a year ago, according to Niebanck: "They don't have a telecom division per se anymore." Niebanck founded the division eight years ago and was let go by Merrill Lynch last March as part of a downsizing effort that has so far done away with close to 8,000 positions at the investment firm, he said.

Two reasons to leave

Merrill Lynch backed away from the outsourcing contract for two major reasons, according to Thomas Byrnes, vice-president of telecommunications services. First, the firm could not come to terms with the vendors about ways to ensure that its network would run reliably. Second, it wanted to stanch the flow of communications people who "did not bother to wait around to see" whether they would be axed or asked to join a vendor team, he added.

Since then, Merrill Lynch has been working toward what may be described as a modified outsourcing arrangement with MCI, which puts network operations in the carrier's hands but allows an internal Merrill Lynch network management organization to look over MCI's shoulders.

Merrill Lynch created that group in the past few months by combining the data networking part of the former telecommunications division with its data center organization.

The group is responsible for managing Merrill Lynch's IBM Systems Network Architecture network and helping MCI to weigh business and application priorities as it manages the physical side, according to Leonard Accardo, group manager of information processing.

"Every communication line is not equal" in terms of the importance of keeping it up and running, Accardo said. "If a line to a stock exchange goes down, no one does business on that particular exchange, while if a branch line goes down, that's obviously not as critical."

Last week, top Merrill Lynch systems and communications executives met with MCI to discuss "where to go from here," now that the two companies had finished a one-year project of converting some 500 Merrill Lynch sites to MCI's network.

According to Accardo, DuWayne Peterson, Merrill Lynch's executive vice-president of operations/systems and telecommunications, "made it clear that we've saved a lot of money over the past couple of years, and now our primary efforts have to be toward quality" issues such as improvement of network response time and availability levels.

Merrill Lynch spokesmen expressed their satisfaction at the meeting with the way MCI has filled the firm's networking needs so far.

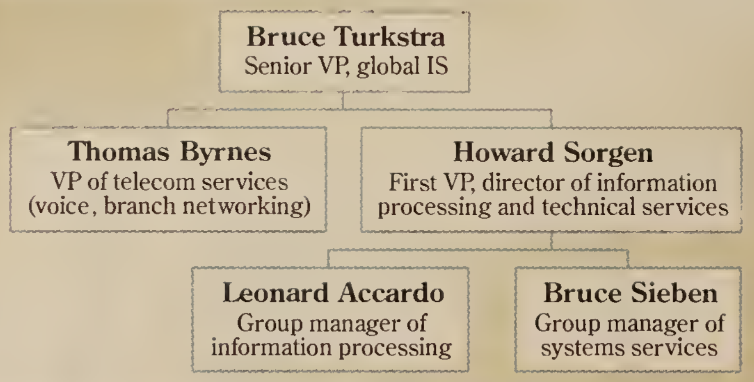
The question is whether Merrill Lynch still has enough high-quality network management personnel on board to retain some control of its networking future or whether MCI will assume almost total domination.

Merrill Lynch may have lost more of its key networking personnel than it can afford through a combination of its own downsizing efforts and the outsourcing uproar, Niebanck said.

"The four or five people that were key to the telecommunications organization have left," including William Gaze, the original designer of the investment firm's private network, he added. "I think that he will be missed."

Bearish on telecom

Merrill Lynch's reorganization has sharply cut its telecommunications division, concentrating its attention on data networking



CW Chart: Marie Haines

GTE to tighten telecom grip with Contel buyout

BY ELLIS BOOKER
CW STAFF

GTE Corp. last week said it had reached a preliminary agreement with Atlanta-based Contel Corp. to acquire the company in a stock trade worth about $6 billion at current prices.

If GTE, based in Stamford, Conn., succeeds in obtaining regulatory approval for the purchase, the combined firm would be the nation's fifth-largest phone company and would have the second-largest cellular telephone network.

According to a GTE spokesman, the firm hopes for a definitive agreement within a few weeks and final completion of the deal by year's end. The Federal Communications Commission, as well as the individual state public regulatory commissions, must rule on the merger.

Contel and GTE "are taking a cue from the regional Bells' centralization and streamlining," said Harvey Popell, a principal at Broadview Associates, an information technology mergers and acquisitions firm in Fort Lee, N.J. This deal "should make other telephone companies examine their portfolios and decide whether they should be buying [their competitors] or maybe divesting," he added.

The synergy between GTE's and Contel's cellular operations was an clear attraction of the deal, analysts said. In April, GTE agreed to acquire the cellular phone operations of the Providence Journal Co. for $710 million. Earlier this year, McCaw made a major cellular purchase, buying controlling interest in Lin Broadcasting Corp. for $3.4 billion.

GTE, which has phone operations in 46 states and a major lighting business, posted net earnings of $1.4 billion on sales of $17.42 billion last year. Contel netted $277 million on $3.1 billion in revenues last year.

Both firms also supply units that provide telecommunications equipment to businesses, satellite communications services and cable television enterprises.

If the deal goes through, Contel Chairman Charles Wohlsetter, 80, and Vice-Chairman John L. Segall will reportedly become vice-chairmen of GTE and members of the board.

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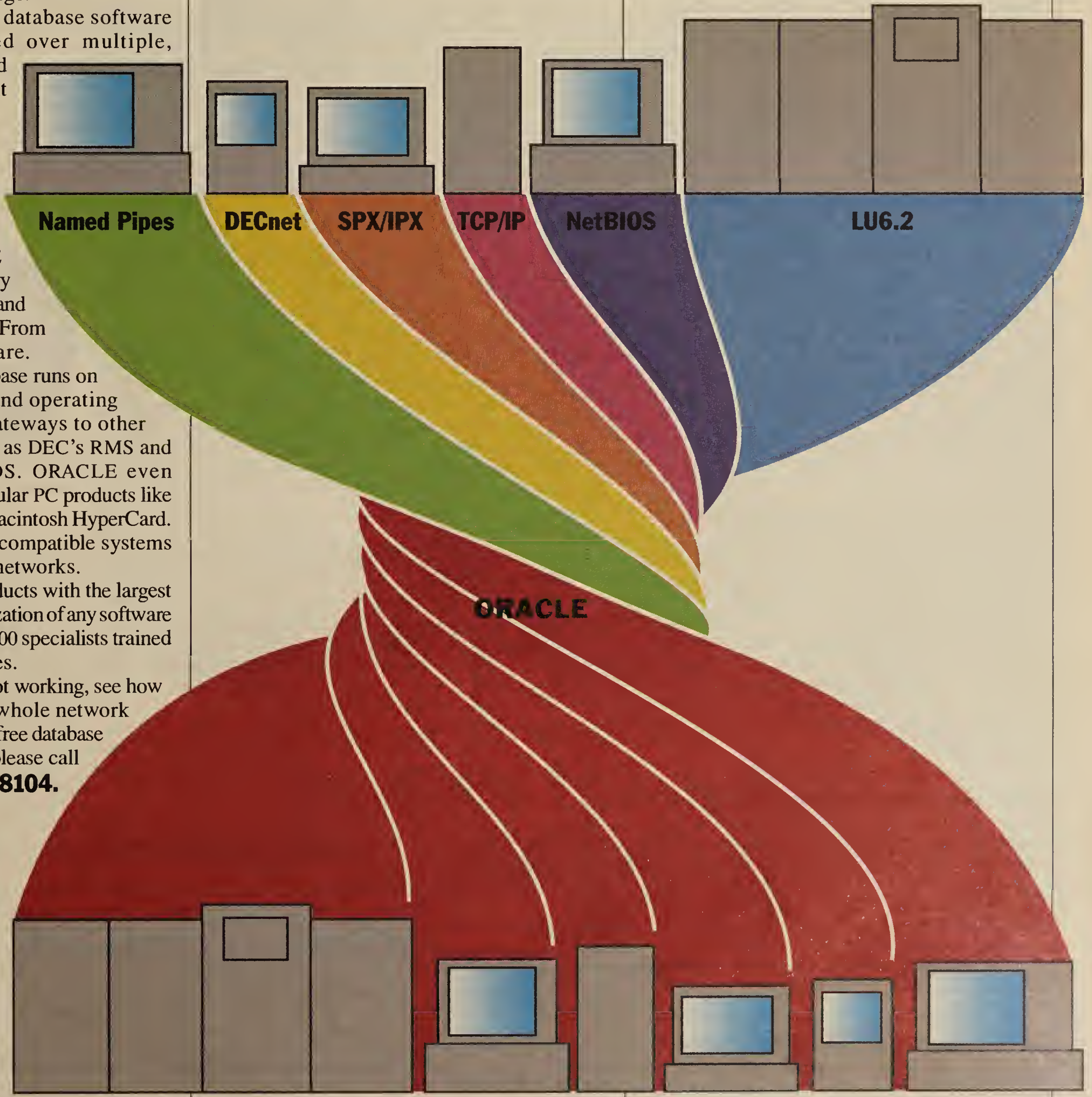

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NEWS SHORTS

Hypercard developer leaves Apple

The exit door continued to swing at Apple Computer, Inc. last week as Bill Atkinson, who developed the popular Hypercard program and ranked as one of the company's leading scientists, announced that he is departing to create a new company with two other former Apple staffers. Atkinson teamed up with Andy Hertzfeld, one of the architects of the operating system for Apple's first Macintosh computer, and former Apple engineer Mark Porat to form Grand Magic, Inc., which is located in Mountain View, Calif. Hertzfeld cryptically described the company's future offering as a personal intelligent communicator, but he has said in the past that he was working on a Macintosh-like windows-and-icons interface to be used on a television.

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Semiconductor bookings slip

The semiconductor book-to-bill ratio, one of the most closely watched indicators of the health of the chip industry, dipped from 1.14 points in May to 1.06 in June, the Semiconductor Industry Association said last week. The figure means that for every $100 worth of products chip makers ship, they received $106 in new orders. The June figure, however, is an improvement over the June 1989 figure of 0.90. Analysts said they were not worried about the slip because the unusually high ratio for May was unsustainable.

……

Graphics workstation war grows

Evans & Sutherland Computer Corp. threw another curve in the hotly contested graphics systems market last week when it announced a high-performance graphics workstation for less than $30,000. The ESV3 reduced instruction set computing-based system will compete for turf in the rapidly expanding market with companies such as Silicon Graphics, Inc. and Stardent Computer, Inc. The Unix machine is priced at $29,900 and is available immediately. The Salt Lake City-based firm is most widely known for its computer graphics applications, including sophisticated flight simulators.

……

FCC to forge ahead on ONA

Federal Communications Commission Chairman Alfred Sykes said last week that the agency will press on with its plans to foster the development of open network architecture (ONA). The move comes despite a recent decision by a federal appeals court that appeared to reject a 1986 FCC ruling giving the Bell telephone companies freedom to offer enhanced information services such as electronic mail and database services. "I don't see a departure from the course we've been on, [and] ONA development should not be significantly slowed," he said. According to Sykes, the FCC is scheduled to begin a new look at the matter in the fall.

……

Athena bears commercial fruit

Digital Equipment Corp. announced last week the commercial availability of products and integration services based on Athena, a joint IBM-DEC project to develop distributed desktop management services for MIT. The Athena offerings provide security, systems management and "easy resource access" across a distributed network of multivendor Unix workstations, a DEC spokesman said. The vendor will initially target the academic community but also sees the business sector as a likely market, the spokesman added.

……

AT&T to digest Western Union unit

To accommodate its recent $180 million purchase of most of Western Union's Business Services unit, AT&T has appointed Gordon Bridge, former AT&T Computer Systems co-president, to head what the telecommunications giant is currently calling the AT&T Global Messaging unit. As president of the new business unit, Bridge will report to Vic Pelson, group executive for AT&T core businesses. Richard McGinn will become the sole president of AT&T Computer Systems, reporting to Robert M. Kavner, group executive of AT&T's Data Systems Group.

Kapor group lines up for rights fight

BY MICHAEL ALEXANDER
CW STAFF

WASHINGTON, D.C. — A pack of peacemakers ambled into town last week with money on their hips and a resolve to lay down the law on the computer frontier.

At a press conference, Mitch Kapor, founder of Lotus Development Corp. and On Technology, Inc., announced that he and John Barlow, a song lyricist and ex-cattle rancher, had created the Electronic Frontier Foundation (EFF) to fund legal efforts to apply First Amendment protection to computer and communications media. The group plans to encourage development of software that makes it easier to use computer networks, among other activities.

Mitch Kapor, *co-founder of EFF*

"We want to help civilize the electronic frontier" — the gap that now exists between society and technology, Kapor said. The foundation will be based in Cambridge, Mass.

The group's founders were quick to say that EFF does not condone unauthorized entry by hackers into computer systems and would not defend hackers accused of such crimes. It will not be a "hacker defense fund," Kapor said.

Kapor added that he, Steve Wozniak, co-founder of Apple Computer, Inc., and a "Silicon Valley high-tech pioneer who wishes to remain anonymous" had each made a "six-figure initial commitment to the foundation."

Among the foundation's first acts was to award a $275,000 grant to Computer Professionals for Social Responsibility, based in Palo Alto, Calif. The funds will be used to host a series of policy roundtables during the next two years with lawmakers, computer users (including hackers), law enforcement officials and others.

EFF is already paying legal fees to Boston and New York law firms providing legal assistance to Steve Jackson, founder of Steve Jackson Games in Austin, Texas, and Craig Neidorf, a 20-year-old electronic newsletter publisher.

In March, the U.S. Secret Service raided Steve Jackson Games and the home of an employee and seized computers that it said contained a "handbook on computer crime," Jackson said. The handbook was in fact a game, published in the form of a handbook, called Cyberpunk, Jackson said. Neither Jackson nor the employee were charged with any crimes, but the government held onto his computers for nearly four months, according to Jackson.

One of the seized computers was used for an electronic bulletin board and "one of the things we're very interested in is the U.S. Secret Service's interest in electronic bulletin boards," Boston attorney Harvey Silverglate said. "If you go in and take the equipment that runs one of these, it is the equivalent of going in and seizing the presses at *The New York Times.*" This prior restraint of publication is a certain violation of the First Amendment, he said.

The foundation also plans to seek "friend of the court" status for Craig Neidorf, a University of Missouri student and co-publisher of "Phrack," an electronic newsletter for hackers. Neidorf has been indicted for his alleged participation in a scheme to steal documentation for an enhanced 911 emergency system from Bellsouth Corp.

Steve Wozniak *contributes funds*

Crime doesn't pay — hackers do

Three hackers pleaded guilty last week to their participation in a scheme to steal documentation for an enhanced 911 emergency telephone system from Bellsouth Corp.

The three are members of the Legion of Doom, a group of hackers that has been involved in numerous computer-related crimes, federal prosecutors in Atlanta and Chicago said.

In Chicago, Robert J. Riggs, 21, pleaded guilty to interstate transportation of stolen property and wire fraud charges. He faces up to 15 years in prison and fines of up to $500,000.

Riggs, along with Adam E. Grant, 22, of Atlanta and Franklin E. Darden, 24, of Norcross, Ga., was also indicted in Atlanta last February for conspiracy to commit computer fraud, wire fraud, access-code fraud and interstate transportation of stolen property. Riggs and Darden each pleaded guilty to one count of conspiring to commit computer fraud. Both face a maximum penalty of five years in jail and a $250,000 fine. Grant pleaded guilty to having 15 or more Bellsouth access codes with the intent to defraud.

Sentencing has been set for Sept. 14. "That is when the fireworks will start," said Kent Alexander, assistant U.S. attorney in Atlanta. "There is a distinct possibility that this may be one of the first instances of a hacker [Riggs] going to jail."

In an indictment last February, federal authorities alleged that in September 1988, Riggs and Craig Neidorf, an electronic newsletter publisher, began a scheme to steal documentation to an enhanced 911 system from Bellsouth. Riggs downloaded the text file in December 1988 and posted it on a computer bulletin board in Lockport, Ill., the indictment said.

Neidorf allegedly retrieved the 911 program from the Lockport bulletin board service, edited the document and reposted it on the bulletin board for Riggs to review.

Neidorf has admitted to publishing an edited version of 911 documentation along with information on how to alter telephone switching software so that calls are put into an endless loop. He pleaded not guilty to the charges and is currently set to go to trial next week. Neidorf contends that he was not aware that the 911 documentation had been stolen, said Sheldon Zenner, his attorney. "There is only one guy here who has not broken into anything, and that is Craig Neidorf."

However, government documents asserted that Neidorf was involved in the scheme from the outset. According to the plea agreement between Riggs and federal authorities, Riggs contacted Neidorf and told him that he was transferring a text file stolen from Bellsouth. Also, in an affidavit for a search warrant, a U.S. Secret Service agent alleged that Neidorf admitted to knowing that the 911 documentation was stolen. His edited version of the Bellsouth 911 documentation contained a Bellsouth notice forbidding disclosure of the text file's contents, the agent added. Riggs is expected to testify for the prosecution.

MICHAEL ALEXANDER

National security thwarts business

Rules and squabbles stifle commercial security products

BY GARY H. ANTHES
CW STAFF

U.S. government concerns about national security are ironically inhibiting the development of computer security technology, leaving commercial systems in the U.S. dangerously and unnecessarily exposed, industry officials said.

Some 20 years of research have given the U.S. a commanding lead in methods for safeguarding computer systems, said Stephen T. Walker, president of Trusted Information Systems, Inc. (TIS). "But confusing government policies are squandering that lead," he said.

Since the government will not allow export of products with the most stringent security features, companies are reluctant to develop them, Walker said. "They say, 'If I can't export it, I won't build it.' "

According to Walker, Digital Equipment Corp. abandoned an important project earlier this year to develop a computer able to support multiple operating systems, each running at a different level of security. Development was well under way — some six beta-test sites were established — when DEC threw in the towel, in part over worries about the difficulty of getting the product out of the U.S., he said. "We decided not to bring it to market," confirmed Steven Lipner, manager of the secure products group at DEC. "Getting licenses for field test sites overseas was difficult. Our experience was that the review process [for government licenses] took an indeterminate amount of time."

Loosening the reins

Officials at DEC, IBM, Oracle Systems Corp. and TIS are urging the government to relax its reins on the export of state-of-the-art secure systems. In a joint letter to the National Institute of Standards and Technology (NIST) — with which the National Security Agency (NSA) is directed by law to develop standards for computer security — the officials said, "It is our discouraging conclusion that whatever level of trust is selected for application of export control measures, this policy will establish a boundary that [commercial systems] will never exceed." U.S. vendors will not bear the cost of developing separate product lines for domestic and overseas markets, they said.

Stephen Kent, chief scientist at BBN Communications, Inc., said the export issue may be based in part on a misunderstanding of the NSA's policy. Kent said a panel of the National Academy of Sciences, on which he serves, was recently assured by an NSA official that the agency had never blocked export of a computer system because of its level of trust or safety features in its operating system. "They assured us this wasn't a problem. They don't have a cutoff level for export," he said.

However, the agency does sometimes oppose an export if it also includes sensitive software tools used to develop and test the system, Kent said.

NSA and NIST are also under fire for lack of progress in developing a federal standard for public-key cryptography, an increasingly popular approach for safeguarding data transmissions.

An emerging de facto standard is embodied in the software products of RSA Data Security, Inc. But the algorithm for public-key cryptography used by RSA is so foolproof that NSA fears that it may hamper its own intelligence-gathering efforts, industry sources said.

"NSA is not in favor of anything in crypto. Everything is being stopped by NSA," said Walker, an ex-NSA employee and author of its criteria for evaluating trusted computer systems.

Although neither agency will officially acknowledge it, governmental and business sources cited a long-simmering territorial dispute between NSA, whose primary concern is secure communication of classified information through encryption, and NIST, which is more interested in application and operating system controls to protect sensitive but unclassified data in computers.

While the agencies squabble over the pending standards, many commercial organizations are going their own way to develop security features for electronic data interchange, electronic funds transfer, electronic mail and secure telephones.

However, many companies are reluctant to embrace any kind of encryption scheme until one is officially blessed by Uncle Sam. James Bidzos, president of RSA Data Security, said banks are among the organizations needing the technology most, but some fear use of a nonstandard method may invalidate their insurance policies. Others are reluctant to use something unless it has been endorsed by an official body. The communications networks and computer systems of many banks are at risk as a result, he said.

Asked about the NIST/NSA relationship, Stuart W. Katzke, chief of the computer security division at NIST, said, "Conflict is too strong a word. It's a matter of reconciling two different concerns." Katzke said NIST will publish the first of four standards for public-key cryptography this fall, some eight years after first proposing to do so. The standard will deal with digital signatures for message authentication, he said.

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IBM signs on to LAN mix plan

BY PATRICIA KEEFE
CW STAFF

NEW YORK — IBM and 3Com Corp. announced last week they have teamed up to develop a set of network management specifications that will manage devices on mixed Token-Ring and Ethernet networks while conserving memory in desktop environments.

A final draft should be available by the fourth quarter, although commercial products incorporating the specification will not be forthcoming until late 1991, according to IBM.

Applications written to this specification, dubbed the Heterogeneous LAN Management (HLM) architecture, will reportedly enable local-area network managers to simultaneously control, monitor and analyze network information on interconnected Ethernet and Token-Ring networks with one tool. This is not possible today in an open systems environment, users contacted last week said.

Mixed LAN plan

IBM and 3Com plan to ease management of proliferating devices attached to Ethernet and Token-Ring networks

	Ethernet	Token-Ring
Personal computers	4,200,000	2,200,000
Technical workstations	600,000	less than 10,000
Mainframes/Minicomputers	350,000	10,000
Bridges/Routers	30,000	10,000

Number of nodes

Source: International Data Corp.

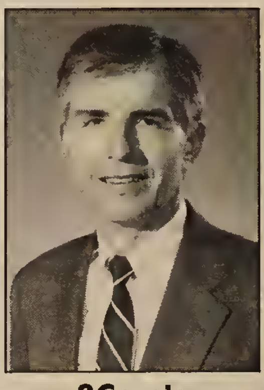
CW Chart: Marie Haines

Many user sites, particularly in the transportation, utility and education sectors, have separate installations of both networks, but the trend is to link them up, according to International Data Corp., market researchers in Framingham, Mass. A survey of 24,000 contacts at 12,046 sites revealed that 19% have both network types installed.

The Burlington Coat Factory in Lebanon, N.H., uses only Ethernet, in part because of interoperability issues, MIS manager Michael Prince said. "A reason why we might shy away from installing Token-Ring would be the network management issue and the extent to which both LANs could be centrally managed from one facility," he said.

That is the situation at Aion Corp., a software developer in Palo Alto, Calif., running an Ethernet shop. Network manager Rick Reed said the lack of interoperability and cross-management has stopped Aion from picking up Token-Ring, even though he expects he will need one to simulate his customer's heterogeneous environments for software development purposes.

Both Aion and the North American Banking Group at Citicorp use bridges and routers to connect Ethernet to Token-Ring when necessary, and neither wants to overload its systems with even more software. "I could get excited [about this] if it meant that I could use [one] protocol analysis type of device on either side of my network, regardless of the access method employed," said Brian Illari, an assistant vice-president in charge of LANs at Citicorp. He said he would also require support of IBM's 16M bit/sec. Token-Ring.



3Com's Denend

In addition to the joint development agreement, 3Com and IBM said they will seek support for the completed specifications from various industry standard groups and will welcome input from other industry players.

"Microsoft believes this project will benefit [OS/2] LAN Manager customers and applauds the industry's cooperation," said Bruce Jacobson, a group product manager at Microsoft Corp. However, he did not say whether Microsoft would interject itself into the HLM project.

At press time, Novell, Inc. was still preparing a statement. Novell's Netware network operating system runs over both Ethernet and Token-Ring.

Leslie G. Denend, an executive vice-president at 3Com, conceded that the effort probably cannot succeed without support from Novell, which controls the bulk of the LAN market, and Microsoft, which is pitching OS/2 LAN Manager as the networking standard of the future.

Bureau correspondent Jim Nash contributed to this article.

Users biggest losers in spreadsheet wars

ANALYSIS

BY NELL MARGOLIS
CW STAFF

As industry observers watch the courtroom doors to see which rival spreadsheet vendor Lotus Development Corp. will haul through them next, spreadsheet users appear to be thinking that they have nothing to worry about.

According to lawyers, that may be because users are not thinking, or at least not thinking hard enough.

"I don't care one bit about any of this lawsuit business," said a user of Borland International's Quattro spreadsheet soon after Lotus' legal assault against Borland on the charge that Quattro and a second product, Quattro Pro, infringe on Lotus' copyrighted 1-2-3. The user, one of many Quattro users at Hughes Aircraft Co. in El Segundo, Calif., asked not to be identified.

"We bought Quattro because of the price — it costs one-fourth of what Lotus does — and we're going to keep right on using it unless the courts say, 'You've got to rip it out of your building.' And they're never going to say that," the user said.

Frank Crow, accounting manager at Noramco, Inc., a bulk pharmaceuticals company based in Athens, Ga., and a Quattro user site, was similarly sanguine. "Quattro is a good product and a good buy, too," he said. "I doubt that anything is going to come out of this lawsuit that would make much difference to us."

Lawyers know better than to bet on the outcome of litigation. Last week, however, several noted that regardless of who ultimately wins the series of look-and-feel lawsuits, users stand to lose.

"All of this litigation isn't doing users any good," said Lee Hagelshaw, a partner in the San Francisco-based law firm of Hagelshaw and Cole. At the end of the day, he and other intellectual property attorneys said, the user community could come out on the short end of what promises to be a lengthening series of costly lawsuits, in several respects.

If Lotus wins — and, at federal court level, it has already cinched one decisive victory [CW, July 2] — it could achieve a virtual monopoly in the spreadsheet market. For users, this would mean less choice in both the software and its price tag.

Lotus' legal assault on Borland, industry observers said last week, puts a possible name and dollar figure to that threat. It also moves the debate to a higher plane, they said. Several of the same commentators who expressed little sympathy for Paperback Software International, Inc., which they dismissed as having tried to profit from a quick and dirty cloning of Lotus 1-2-3, voiced no such scorn for Borland or its products, perceived as high-quality variations on the 1-2-3 theme.

Muddled standards

In addition, a judicial expansion of copyright protection for software rains further confusion on the already unclear movement toward standards in the software arena, according to Ned Saltzberg, a partner at Boston-based Warner & Stackpole who represented Stephenson Software, one of the defendants that Lotus defeated along with Paperback late last month. It is users who have clamored for standards, he said; it is users who will be inconvenienced to the extent that developers feel crushed between the competing interests of satisfying the customers and avoiding lawsuits.

"I've already had several [software developer] clients call to ask, 'What are we supposed to do?' " Hagelshaw said.

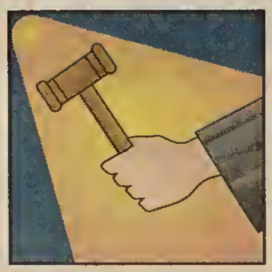
The lawyers who are bombarded with this question will not be able to give their clients satisfyingly concise replies, said Steven Shaiman, who specializes in intellectual property protection at Philadelphia-based Shaiman & Bosch. "How do you reconcile standards with protected rights? Where do you draw the line between public interest and private interest?" he said.

Moreover, Saltzberg said, although every party in the the recent rash of lawsuits claims that victory for its position would benefit users, users themselves have been strangely absent from the courtroom.

"Users need an advocate [in these cases], and so far, there hasn't been one," he said. "Maybe in the next suit, a user group or organization will file an amicus brief."

Goal concedes copyright infringement

BY JOHANNA AMBROSIO
CW STAFF



COLUMBUS, OHIO — Goal Systems International, Inc. is writing a new version of its Runtrac product, due out within six months, because the company has conceded there is some code in Runtrac that infringes on Computer Associates International, Inc.'s CA-11 package.

Two weeks ago, CA filed a lawsuit alleging copyright infringement against Goal, one of Goal's developers and the developer's former company [CW, July 2]. Since then, Goal has completed its investigation into the matter and fired the developer, Jerry Bennett.

"Our preliminary investigation, which was conducted in cooperation with CA, indicates that there was infringing of code in portions of Runtrac when we acquired it in 1988," said David C. Wetmore, Goal's president and chief executive officer.

Although the legalities are far from settled, it now appears that existing Runtrac customers, which total fewer than 200, will have to swap their current version of Runtrac for the new version. "I believe that's the way it will happen," Wetmore said. The other option is that CA will get a royalty, and in return, existing customers will be allowed to keep their current Runtrac versions.

"It's up to Goal to make sure the new Runtrac is functionally equivalent to the old one and to make sure the transition is an easy one," Wetmore said. "And we will do that." He claimed switching Runtrac products will not be a big deal to customers.

A related Goal product, Jobtrac, "appears free of questionable code," Wetmore said. But the interface from Jobtrac to CA-11 was restructured and is now available to Jobtrac customers. An interface between Jobtrac and Runtrac will be included in the new version of Runtrac.

Now that Goal has conceded that its product does infringe on CA, the issue of damages is left for the two companies to resolve. Talks to settle the lawsuit out of court have broken off, and the two companies are not currently negotiating.

CA's world

- Investors stomp stock after revenue dip talk. Page 132.
- Security conference draws users, new products. Page 10.

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Security issues get a lock on users' attention

BY JOHANNA AMBROSIO
CW STAFF

ORLANDO, Fla. — It may not be one of the information systems department's favorite jobs, but security is receiving more attention in a growing number of shops. Topping the to-do lists of many users is the need to get a handle on the personal computers and minicomputers that have access to the corporate mainframe.

"There are a lot of holes out there," said Gary Savolainen, technical consultant for data security at Royal Trust in Ontario. "You can't completely control what's coming into the mainframe." He said Royal Trust is attempting to better secure the Application System/400s that connect to its IBM host.

Users spoke about these and related issues at the annual conference for customers of Computer Associates International, Inc.'s security software, held last week in Orlando. CA unveiled new security products at the conference, which attracted some 1,700 people (see story below).

Security is on a lot of minds these days. According to Computer Intelligence in La Jolla, Calif., 47% of the IBM and plug-compatible mainframe base has some kind of security package. That is up from 43% a year ago and 21% in 1985.

"Security is one of the fastest growing mainframe markets," said Jerry Berry, a software industry analyst at Computer Intelligence.

Those users who were willing to be interviewed said their most acute need is in the area of distributed computing. This includes controlling and monitoring information that is uploaded from or downloaded to PCs and minis and administering the security for a network of heterogeneous computers from one place.

As things now stand, users generally have to administer security separately for different computers. For example, when a password is deleted, the administrator has to delete the password from the security program of each computer to which the user was allowed access.

At NCNB Texas National Bank, there are between eight and 10 security packages in the Dallas data center alone. "We want one standard package to control everything," said Glinda Cummings, manager of data security at the bank in Dallas. "But that's blue sky. I hope I live long enough to see it."

Her thoughts were echoed by Richard D. Sinnott, a member of the operations staff at Ciba-Geigy Corp. in Greensboro, N.C.: "Our direction is to get everything onto one security package."

Rohm and Haas Co., a Philadelphia-based chemical manufacturer, is "looking at the issue of PC security," said Barbara A. Glabere, computer security administrator in the firm's computer applications research department. "We're checking into different PC products but haven't made any decisions yet."

Perhaps one measure of how the security industry has grown is that more IS departments are allocating staff members to focus on security issues. At NCNB, for example, the minicomputer security staff comprises six people.

"With all the attention that security breaches have gotten in the press, companies realize the need to devote full-time professionals to this," said Gary Sheehan, senior security specialist at Progressive Corp. in Mayfield, Ohio.

CA takes the mike

CA took advantage of the user groups convened in Orlando to announce enhancements to its security packages and one new related product. Among the enhancements are virus-control features and the ability to control DB2 security through one of CA's security packages.

Furthermore, Charles B. Wang, CA's chief executive officer, repeated the firm's pledge to keep ACF2 and Top Secret as two separate and supported product lines: "We will not merge them. We want to protect the client's investment."

CA also announced a workstation that provides on-line, interactive Help and documentation for CA's ACF2 security package. The workstation, called the Online Consultant, uses multimedia — text, voice and video stored on compact disc/read-only memory — to teach users about ACF2.

DB2 links from both CA mainframe security packages are available for beta testing. These features will allow the security administrator to control and audit resources and events occurring in DB2 through the rules and procedures in CA's security packages.

The virus-control feature, available in Release 6.0 of IBM's MVS version of CA's ACF2, is said to prevent viruses and similar problems from spreading to data and programs with a high integrity level.

JOHANNA AMBROSIO

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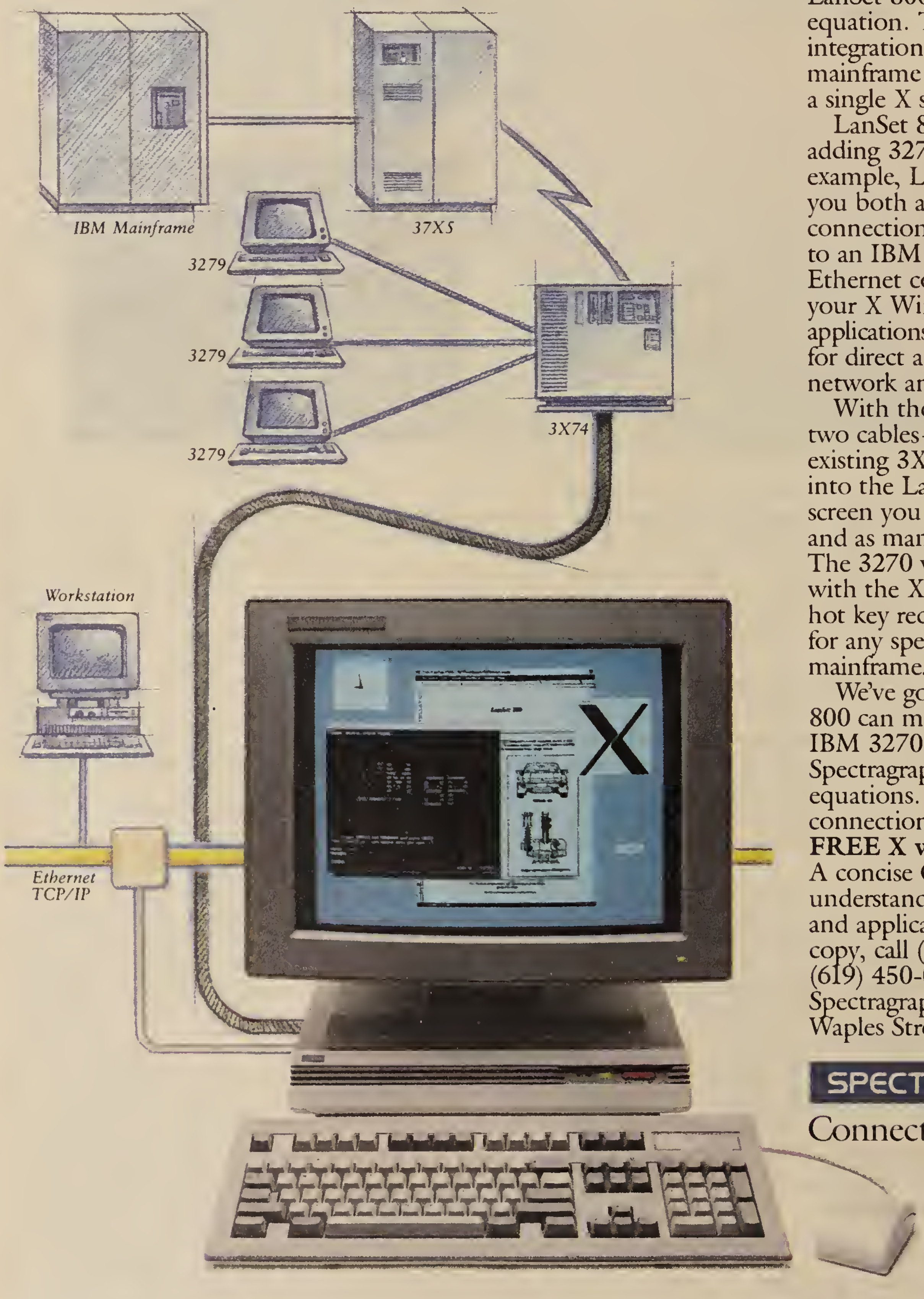

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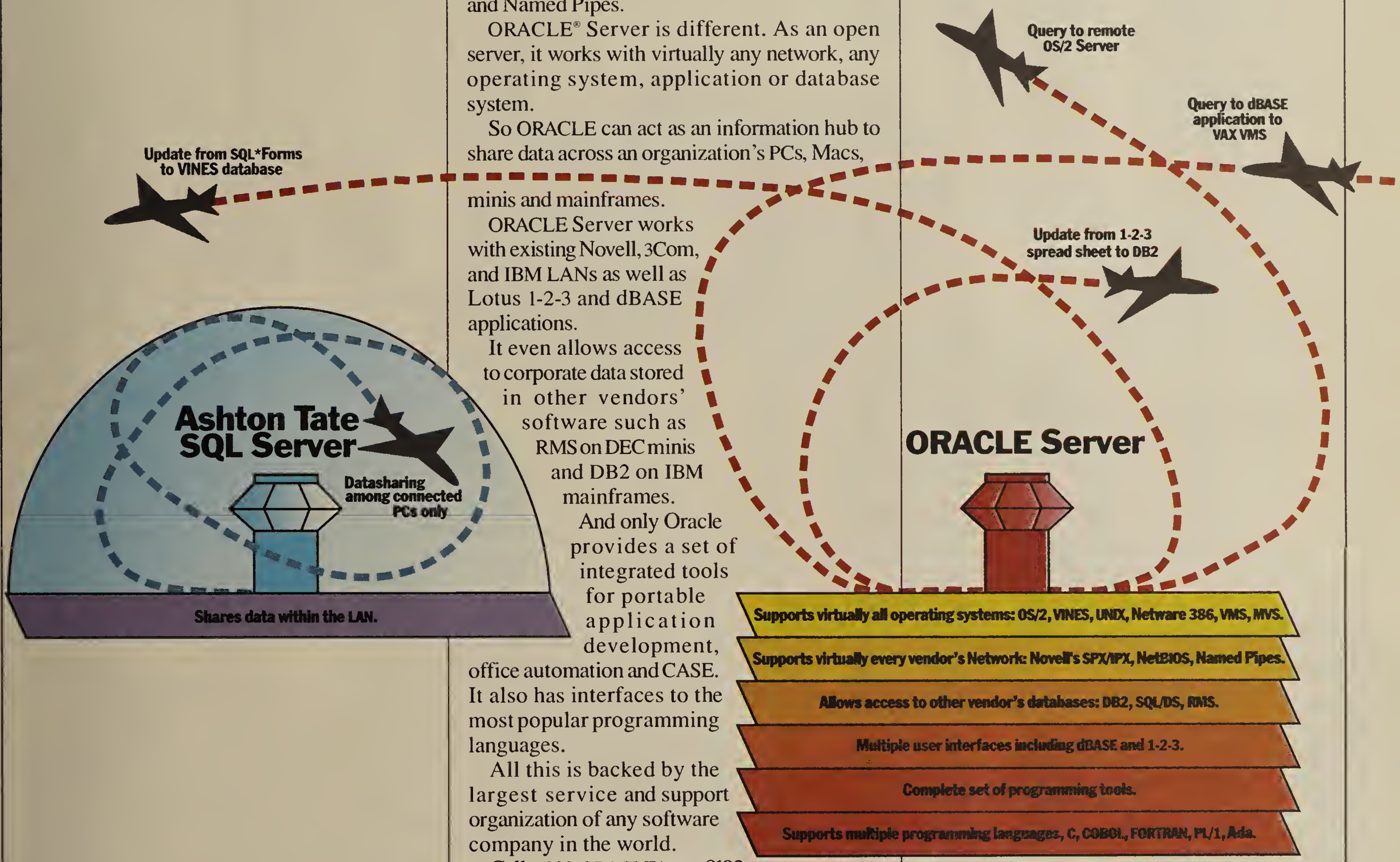
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Cray exec leaves over strategy dispute with CEO

BY ELLIS BOOKER
CW STAFF

MINNEAPOLIS — Cray Research, Inc. President and Chief Operating Officer Marcelo Gumucio, a fixture in the supercomputer maker's management team for the past eight years, resigned unexpectedly last week.

In a letter to employees, Cray Chief Executive Officer John A. Rollwagen said he and Gumucio had disagreed on the execution of the company's long-range strategy. "We attempted to blend our distinct management styles effectively, but we were not successful in that effort," Rollwagen said. Gumucio also resigned from Cray's board of directors.

The resignation surprised industry analysts, who nevertheless agreed that the two top executives brought very different management styles to the job. Rollwagen, described as intuitive and entrepreneurial, promoted a relaxed, collegiate atmosphere at Cray, while Gumucio was more analytical and structured.

"Marcelo was trying to instill a formal structure and discipline . . . to make Cray more large company-like," said Patricia Laupheimer, a vice-president of research at Shearson Lehman Hutton, Inc. in New York. Although noting this effort may have led to "some ill feeling with employees," Laupheimer credited Gumucio with promoting Cray's push into the low end of the supercomputer market, held by the likes of Convex Computer Corp. in Richardson, Texas.

Cray's Gumucio
left unexpectedly

Cray's stock rose following the announcement of Gumucio's resignation, but Laupheimer said the firm will miss the marketing focus he brought to it.

Gumucio, 52, joined Cray eight years ago as executive vice-president of marketing, taking the title of president and COO in November 1988.

Rollwagen, 49, said he will take on the duties of COO and president "for the foreseeable future." A possible successor, Laupheimer speculated, could be Bob Ewald, now Cray's executive vice-president of software.

Profs

CONTINUED FROM PAGE 1

got to make some serious sacrifices to get there." Further corporate austerity moves are scheduled to be announced today in St. Louis.

But users are puzzled about how the savings will be made, especially if the IBM mainframe running Profs under the VM operating system is not itself shut off. "The only way they're going to save money is by eliminating some hardware or software, not by freeing up capacity on some disk drives," one Douglas Aircraft employee in Southern California said.

In addition to E-mail, Profs supported calendaring and group scheduling of meetings. "We hope this loss is temporary," one longtime Douglas Aircraft employee said. "The people who did this to us see it as a cost-saving measure, but we are trying to tell them it's penny-wise and pound-foolish. They're also laying off people in the mail room. What are they going to do next? Rip out the phone lines and attack all methods of communication?"

"The savings will come primarily in our ability to use that [extra computer] capacity to offset our needs in other application areas," said Rich Nelson, business unit manager for computer operations support at Douglas Aircraft's Automated Systems Center in Long Beach. "It's yet to be seen if we're going to get the results that were intended."

While Profs will no longer be available, the underlying VM/CMS messaging system will be, Nelson noted. Although underutilized, the VM/CMS messaging system could support E-mail services to link Douglas Aircraft's 25-plus buildings scattered throughout Long Beach and the nearby Southern California communities of Torrance and Cypress. If the alternate system were to become widely used, however, the savings in system resources bought with Profs' dismissal could be lost, Nelson said.

Douglas Aircraft is burdened with higher costs linked to launching the new MD-11 commercial jet and enduring a corporate hit as parent McDonnell Douglas faces massive defense cutbacks. "Each component of the company is looking at all their costs, including the costs of electronic messaging," a McDonnell Douglas spokeswoman said.

To save money, Douglas Aircraft announced 3,000 layoffs from its work force of 50,000 in May and centralized three information systems staffs into one in April. McDonnell Douglas still has 131,000 employees worldwide, but more layoffs are expected. Even the McDonnell Douglas computer services division, the Systems Integration Co., has wasted away to a $290 million unit after selling its Tymnet operation and other computer services companies — a far fall from $1.2 billion in the late 1980s.

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Leader of young scientists granted Siemens Award

Part of a series of profiles of Computerworld Smithsonian Award *winners.*

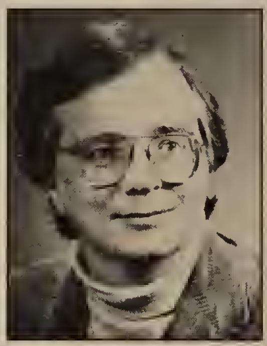
BY RICHARD PASTORE
CW STAFF

Scientists in the Soviet Union and Japan who are studying acid rain send their findings via personal computer network to a PC in the U.S. A scientist in the U.S. engaged in the same study calls up his colleagues' data and compares it with his own.

Such international cooperation is exciting, but what makes this significant is that the "scientists" are seventh graders.

For his leadership in developing such innovative science education programs, Robert Tinker, chief science officer at the Technical Education Research Center (TERC), received the first *Siemens/Computerworld Smithsonian Award for the Advancement of Science.* The award was presented late last month at a ceremony in Washington, D.C. "Dr. Tinker's vision of children as scientists, tackling real-world problems, makes him the ideal recipient of this award," Siemens Corp. President Hans Decker said.

Tinker has developed several international science networks. Students and teachers in the Global Laboratory, Star Schools and National Geographic Kids Network programs all use networked PCs as their primary data collecting and transmitting tools. TERC's telecommunications programs alone have reached more than 75,000 pupils and 2,500 teachers worldwide.



Tinker *views children as scientists*

Despite the technological slant of the Siemens Award, Tinker has not lost sight of the real goal of his efforts — stimulating young people's interest in science. As a result of the programs, "students are becoming more accurate about their assessment of what their role could be, where they could go and what the career paths are," he said.

TERC, based in Cambridge, Mass., has been promoting such "constructivist" education methods for 25 years. "People learn best by creating their own knowledge in their head instead of having knowledge poured into them," said Tinker, a 48-year-old MIT-trained physicist who has been a full-time TERC leader for the last 12 years. "Technology strongly reinforces this constructivist approach to education — it gives kids more options, more power and more sophistication for what they do."

Among the many other programs using computers and networks is an IBM-sponsored Personal Science Laboratory for high school juniors and seniors. TERC-written software allows students to record gathered scientific and mathematical data into a graphical environment, conduct data analysis and export and import data from Lotus Development Corp.'s 1-2-3 and Microsoft Corp.'s Works spreadsheets.

TERC is also addressing educators with its Microsig special interest group. The Boston-area PC network allows teachers to explore ways to expand computer use by special-needs students.

A staff of eight designs and implements the technological portions of TERC's hands-on education pilot programs. The typical development cycle is two to four years.

"We have kids come in here in the early stages to understand what's going on in their heads," Tinker said. "Then we go out to the school to see [the program] in a dynamic classroom environment."

Much of the nonprofit center's funding comes from the National Science Foundation and the U.S. Department of Education. Computer vendors also lend a hand, including IBM, Digital Equipment Corp. and Apple Computer, Inc.

Once an educational program proves its worth, it is turned over to software vendors for sale to schools. Companies producing and marketing TERC software and materials have included IBM and D.C. Heath & Co.

Tinker and TERC face their own set of problems when dealing with computer vendors and equipment. While businesses' primary concern is PC power and reliability, TERC's needs run more toward affordability and ease of use. Consequently, Tinker is hoping that vendors will develop more low-cost products geared toward novices.

The IBM Personal System/1 introduced last month is a step in the right direction, Tinker said. With its $1,000 price tag, built-in modem and Intel Corp. 80286 power, "the PS/1 could be very important to education," he said.

Citing the Siemens Award as proof, Tinker said private industry is increasingly concerned about fostering and promoting science education "for their own self-interest and long-term viability." Because of deficiencies in science education here, companies such as Siemens "can't get creative or even adequately trained employees to do the work they've already got," he said.

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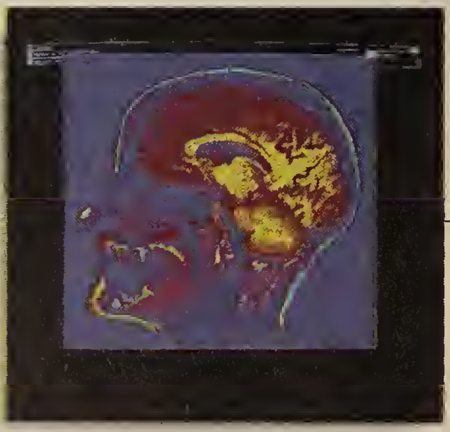

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ADVANCED TECHNOLOGY

TECH TALK

Fast as light

Phototonics Corp. last week introduced a device that links computers in separate buildings by infrared light. The Building-to-Building Photolink, which mounts on the inside of a window pane or on a wall near a window, connects desktop computers that are up to 600 ft apart, the company said. It comes in two versions: Apple Computer, Inc. Appletalk/Localtalk for Macintosh networking environments and RS-232 interface for terminal-to-host applications. The Appletalk/Localtalk version is compatible with Appletalk routers and bridges and transmits at the full 230.4K bit/sec. network speed. The RS-232 version can transmit four channels simultaneously at 9.6K bit/sec. and full duplex.

PCs discovered at Pompeii

Rediscovering Pompeii, an exhibit of more than 200 recently excavated artifacts from Pompeii, opened last week at the IBM Gallery of Science and Art in New York. The exhibition also features interactive programs that show how computer technology is being used by archeologists to explore the site at Pompeii as well as to further research and preservation efforts. The exhibition has been organized by the Italian Minister of Cultural and Environmental Assets/Archeological Superintendency of Pompeii and IBM Italy. It runs until Sept. 15.

Learning software

Researchers at the Institute for Learning Sciences and at Andersen Consulting are looking into the way people learn by using software prototypes based on artificial intelligence and cognitive science theory. The institute, which is at Northwestern University in Evanston, Ill., has developed three prototypes: a sounding board that uses Socratic tutoring techniques in problem solving; "Ask Tom," a collection of interviews with experts on video clips; and language learning, which teaches nonnative language to students.

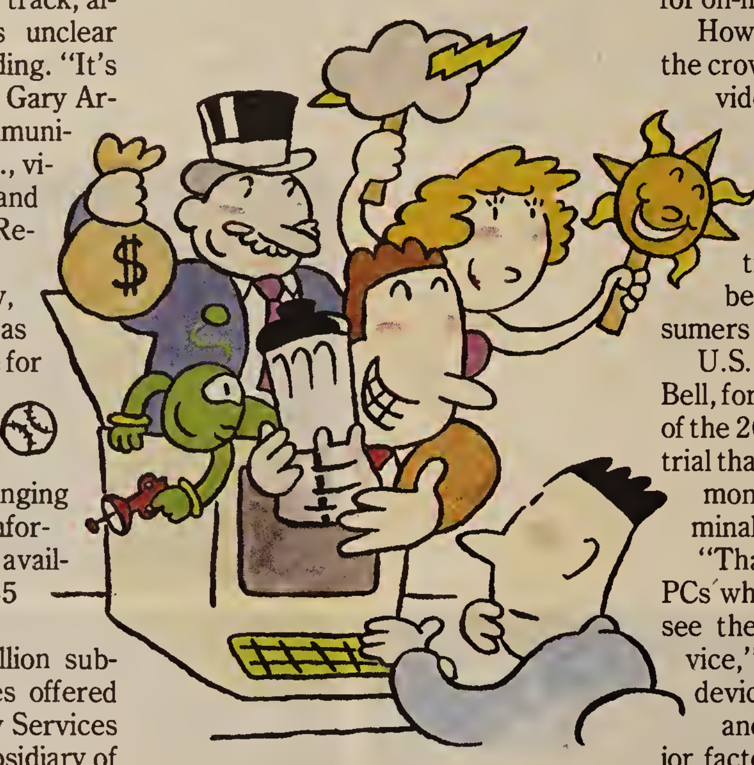
Videotex: Struggling for acceptance

Despite growth potential and business interest, profits are still hard to find

BY MICHAEL ALEXANDER
CW STAFF

"Videotex has a great future if only it can get through the present."
Gary Arlen

After some notable failures in the mid-1980s, videotex appears to be back on track, although it remains unclear just where it is heading. "It's a beast that won't die," said Gary Arlen, president of Arlen Communications, Inc., a Bethesda, Md., videotex research firm and publisher of "Interactivity Report" newsletter.



Though definitions vary, videotex is generally viewed as a two-way interactive service for home and business users that includes text and, increasingly, simple graphics. A wide variety of services ranging from teleshopping to travel information and reservations are available on-line from 35 to 45 companies.

There are about 1.4 million subscribers of videotex services offered by such providers as Prodigy Services Co. and Minitel U.S.A., a subsidiary of French-Telecommunications, according to Robert L. Smith Jr., executive director of the Videotex Industry Association in Silver Spring, Md.

"The industry in general is growing at a 20% to 30% per annum clip," Smith said. "That's not bad growth, but at the same time, everyone in the [videotex] industry agrees that is far from where we would like to be in terms of market size."

The business needs a wider range of high-quality services aimed at both home and business users, Smith said.

Potential videotex customers want easy to use and inexpensive services, said Geoffrey Moore, director of market programs and communications at Prodigy in White Plains, N.Y. Prodigy has been successful marketing to less sophisticated personal computer users by bundling a modem and software in one package and has made its products less costly for users by funding the service through advertising.

"Traditionally, what has been called videotex was a text-based service that charged by the minute, putting most of the cost on individual subscribers," Moore said. "The interface was designed for people comfortable with computers; it required a modem that was difficult to operate."

The company has grown from 50,000 to more than 435,000 subscribers in only 18 months, making it nearly the largest provider, Moore said.

"I call Prodigy the Great White Plains Hope, because everyone hopes that it will succeed," Arlen said. "Its failure would send a message that after spending three-quarters of a billion dollars, if [Prodigy] can't make it work, who can?"

The videotex industry is looking to get a significant boost from IBM's recent introduction of its Personal System/1 home computer that includes a built-in modem and Prodigy. IBM and Sears, Roebuck & Co. are co-owners of Prodigy.

Other PC manufacturers are expected to follow suit with models that include internal modems and software for on-line services bundled in.

However, PCs may not prove to be the crowbar that will pry the lid off the videotex market. There are several companies in the industry betting that a portable television-size terminal, similar to French Telecommunication's Minitel terminal, would be more readily accepted by consumers and perhaps business users.

U.S. Videotel and Southwestern Bell, for example, discovered that 44% of the 20,000 participants in a videotex trial that ended in March opted to pay a monthly fee to use a low-cost terminal rather than their own PCs.

"That suggests that people with PCs who already have a modem don't see the PC as a communicating device," Arlen said. "A telephonelike device, a home information appliance, is certainly going to be a major factor in creating a business — it may not be videotex but an electronic home and office information service."

Several of the Bell operating companies have been experimenting with "smart telephone" technology and are petitioning the Federal Communications Commission to amend regulations that now prohibit them from offering videotex services.

Videotex services aimed at business users are also slowly picking up, according to Smith. The videotex networks are increasingly being used to provide small and medium-size businesses with order entry, direct marketing and other services (see story, this page).

Adding value

Some managers are looking to add value to their internal corporate networks by linking them with outside videotex services providing travel reservations, for example, Smith said. "Hardware and software support is available for PC users; there is no reason why the person in the data center wouldn't want to have access to that same capability."

Videotex, which celebrates its twentieth birthday next year, has long been characterized as a technology in search of a market. Some experts said that the technology is already rapidly becoming obsolete.

Profits have also remained elusive. Minitel, which is often pointed to as the most visible videotex success because it has five million subscribers, has yet to make a profit in seven years of operation.

Giving them the business

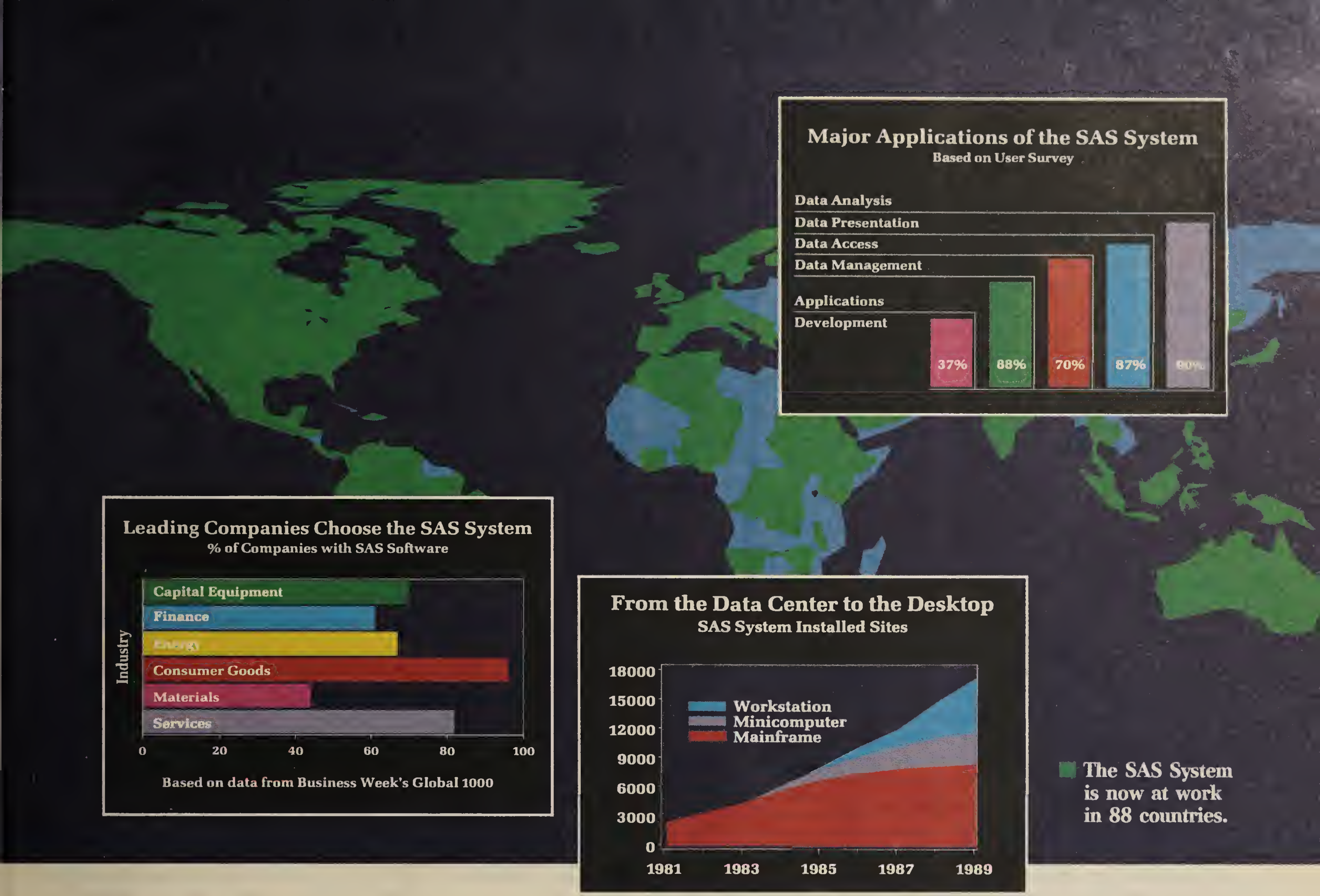
One of fastest growing segments of Prodigy Services Co. is not consumer subscriptions but a division called Prodigy Business Service, which is geared to commercial users during the day when consumers sign off the system and go to work, said Geoffrey Moore, director of market programs and communications.

Artec Distributing, Inc., a prerecorded videotape distributor based in Shelburne, Vt., has been using the service for nearly a year, said Judy Raven, director of marketing for Artec. The 400 retailers enrolled in the service, which is called Artec Express, use it for on-line order entry, inventory look-up and other business applications, Raven said.

Prodigy charges retailers $13/hour on-line, but the tab is ultimately picked up by Artec.

Prodigy has also inked pacts with Moore Medical Supplies and Professional Insurance Agency of California and Nevada, among other firms.

MICHAEL ALEXANDER



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EDITORIAL

Helping hackers

IN THE LAST five years, hacking has evolved from a mischievous pursuit of nerdy teenagers to a legitimate threat to international communications and commerce. If the Internet virus showed how much trouble a single programmer could cause, then the revelation that one group was planning to disrupt the entire 911 emergency network in nine states hammered home the potential damage of a concerted hacking effort.

Law enforcement officials, egged on by nervous business leaders, are reacting with alarm to the situation. But are they trampling individuals in the stampede to end the threat?

The formation of the Electronic Frontier Foundation last week may shed valuable light on this question. The group will draw its share of derision because its mission is to defend the civil rights of computer hackers. But it deserves a chance to raise some emerging issues.

For example, should computer bulletin boards be considered legitimate agents of the press, with all the constitutional protection that entails? If someone publishes information on a bulletin board about how to break into a bank's computer system, who is liable? The originator of the information? The bulletin board operator? The person who uses it to commit a crime? All three?

If law enforcement authorities seize an entire file server from a small business on suspicion that it contains stolen credit card numbers, is that unfair restraint of trade? What if evidence of an unrelated crime is found on the hard disk? Are private electronic mail messages stored on a file server entitled to the same right to privacy as a letter delivered by the U.S. Postal Service? What responsibility do bulletin board operators have for knowing what information is exchanged among their users? How much do they actually have to know about those users?

Increased networking and high-speed communications are making it tougher and tougher to detect the origins of criminal activity and to determine just who is at fault. At the same time, digging out that information involves sifting through increasing amounts of extraneous material in a process that may jeopardize the privacy or livelihood of others.

However, the job must be done, and these issues will be addressed only through the courts. That's where the Electronic Frontier Foundation can make its mark. Not only does the involvement of such respected figures as Mitch Kapor and Steve Wozniak lend the group legitimacy, but also simply raising these issues each time another hacker raid comes to light will force law enforcement authorities to consider their actions more carefully.

On the flip side, we hope Messrs. Kapor et al do not simply use their organization to hold forth on the need to let hackers express themselves or practice their art. Neither business nor the legal community takes that argument seriously anymore. But by picking its targets carefully and sticking to the high road, the group can do a lot to define the boundaries of the debate.

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LETTERS TO THE EDITOR

Easy migration

Your article "When a DBMS doesn't relate" [CW, May 28] omitted important information. For example, the concerns expressed about BWD Automotive are that they are "wary of the major investment required to go relational . . . not the least of those concerns was the task of rewriting thousands of lines of code . . . The access methods of file systems such as VSAM made it necessary to substantially modify programs when the structure of the data was changed."

My firm has converted most of our production data structures from VSAM to Computer Associates International's CA-Datacom/DB using a feature called VSAM/Transparency. This enabled us to quickly migrate from CICS/Cobol to IDEAL, CA's fourth-generation language (4GL), for improving current applications and adding new ones.

The old CICS/Cobol applications continue to be used until they need significant changes; then, we convert them to IDEAL. The old applications access the new Datacom/DB databases with no changes via the VSAM/Transparency feature. Our experience indicates that a relatively modest 10% or less overhead is incurred with VSAM/Transparency.

Moving to a 4GL relational database environment was absolutely critical to our effectiveness (for both mainframe and Unix/Xenix platforms). As an integrated steel producer, we need to efficiently run our information systems (still VM/VSE) while constantly adding to and improving our application portfolio. Systems people are a key asset, and a 4GL plus a relational database management system helps them be successful and productive. Your readers should be aware of the CA-Datacom/DB VSAM/Transparency option and benefits.

Richard R. Bailey
Rochester Hills, Mich.

Impenetrable logic

Your article "What's in store for 1995? PCs will fulfill potential" [CW, June 4] keys into a question that I've been ready to ask for several years.

When someone offers me a "personal agent" that "filter[s] all the information sent to [me]," my first question will be: "How do I set the percentage of information that is to be sent through to me unfiltered, undelegated?"

If the vendor states proudly that all information is filtered — that none can get through randomly — I will immediately reply: "How much did my competition pay you for trying to blind and deafen me by artfully preventing me from seeing anything that doesn't fit my preconceived notion? Get out!"

If this cybernetic butler/jailor only shows you what you've already asked to see, then by definition, no new information can reach you! Your filter will prevent you from noticing when you need to change your filter! Literal insanity.

Rob Higgins
Media, Pa.

Go with the flow

I enjoyed the careful and accurate article that Joe Maglitta wrote about the Centers for Disease Control's Wonder project [CW, June 4]. However, I wish to clarify one point. The article states that data is passed seamlessly between Adabas and Natural. What that sentence should have said was that the Adabas/Natural environment passes data seamlessly to the SAS Institute environment where the requested data is graphed or mapped using SAS Graph — the point being that the person who is signed onto the Wonder system requests the data and can receive it either in tabular, chart, graph or map format.

Regarding my staff, Joseph Reid and Andrew Friede are largely responsible for the ideas behind and the implementation of Wonder.

Howard W. Ory, M.D.
Director
Information Resources
Management Office
Centers for Disease Control
Atlanta

OS/2 on the rise

I believe "Market justice" [CW, June 25] was a weak and clumsily reasoned editorial.

There would be no Apple Macintosh or derivative graphical user interfaces today without the bold pioneering of Lisa.

Your examples of successes all started with weak software support. OS/2 is still frail, but it will make a powerful follow-on to Microsoft Windows 3.0.

Donald C. MacDonald
Dallas

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax: (508) 875-8931; MCI Mail: COMPUTERWORLD.*

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Quell the fear of lessor abuses

KEN BOULDIN

On May 4, Jim Hassett, trustee of lessor CIS Corp., took the podium at the Computer Dealers and Lessors Association's (CDLA) spring meeting. He addressed lessor bankruptcies and CIS, which is in Chapter 11. And he mentioned a number of "abuses" perpetrated by leasing companies.

Among the alleged abuses Hassett described were selling computers before exercising a lease's purchase option; removing features from a leased computer and selling or leasing them without the lessor's knowledge; and subleasing a leased computer without the original lessor's knowledge.

Not surprisingly, that part of his speech caught the attention of the audience, which included a number of industry media representatives. As a result, stories have appeared in industry trade publications about "leasing abuses," "dubious business practices," and the need for the leasing industry to undergo a "spring cleaning."

Hassett did raise some very good points, detailing practices that some lessors in his audience were unaware of and mentioning ways to improve how the industry does business. However, his remarks, and the conclusions reached in articles that subsequently appeared, gave the impression that there is rampant wrongdoing within the leasing industry and that customers should feel jeopardized. I strongly believe this is not the case.

The abuses that Hassett described are far from commonplace in the computer leasing industry. Many of those listening to his speech — including a number of industry veterans — do not believe that these situations were fairly described.

In fact, without the CIS bankruptcy, many of the problems Hassett referred to would never have surfaced. However, the light that Hassett shed on these dubious practices has caused many companies to be more aware of potential problems and to improve the manner in which they do business.

It is also important to realize that, contrary to the impression given by some articles in the trade press, few customers of computer lessors and dealers are actually put in jeopardy by the practices Hassett described in his speech. Many of these transactions are conducted between multiple lessors or dealers in computer equipment and do not even involve the customer.

A *Computerworld* editorial [CW, May 21] commenting on the issues Hassett raised maintained that it is "absolutely essential" for the leasing industry to "clean its own house," but "spring cleaning" is already an ongoing process at CDLA. CDLA maintains and enforces a Code of Professional Conduct and Practices by which all member firms must pledge to abide.

Niculae Asciu

CDLA's Industry Practices Committee hears complaints of violations of this code, and if it is determined that a violation has occurred, the committee imposes sanctions and in some cases expels companies from the association. As a result, CDLA membership is the mark of a professional, ethical organization.

CDLA and the leasing industry do not condone any of the activities Hassett mentioned. The fact that these practices are now a topic of discussion may be one of the few positive by-products of the CIS failure.

A similar phenomenon accompanied the O.P.M. Leasing Services debacle. For example, when that firm's massive fraud was exposed in 1981 it caused lenders to verify that leased machines are actually in place before they commit to financing. For honest companies, this change in procedure was a mere inconvenience; for dishonest companies, it meant the exposure of their schemes.

As with any business, computer leasing and remarketing will always face challenges, and a few companies may fail to meet those challenges. But good companies will continue to rise to the occasion. As Hassett wrote in a recent letter to CDLA, ". . . it was not my intent nor desire to tar the entire industry with regard to these matters, and I also pointed out that one of the inherent problems is that those companies who engage in the practices mentioned create a competitive advantage over those companies who are more concerned with both the morality and ethics, as well as legalities involved."

Lessees wary of the industry need only heed the advice Hassett gave on May 4: Don't base your acceptance of a lease solely on price; the deal that looks too good to be true usually is.

Is computer leasing and remarketing in trouble? The answer is no. A number of CDLA members are experiencing some of their best years in recent memory, with better deals and rising lease rates. The industry *has* experienced some high-profile bankruptcies in the past several years, but these failures were largely a result of money-losing deals that didn't make economic sense or poor management decisions. These firms' problems were for the most part self-inflicted and are not symptoms of a terminally ill industry.

Computer leasing and remarketing is still a healthy industry.

Bouldin is president of the Computer Dealers and Lessors Association.

Why high-tech companies fail from their own success

MARTY GRUHN

The "go-go" 1980s gave our industry a notable rogue's gallery. DEC, HP, Apple, Compaq, Lotus, Microsoft, Ashton-Tate, Novell and Sun Microsystems all broke out of their respective packs and established themselves as standards in the industry. But will they still be luminaries when we look back on the 1990s?

That depends on whether they have done their homework and can avoid some of the traps that have caused other high-tech companies to fail.

One of the problems with success is that it validates corporate cultures and technologies. From this come the sins of internally driven strategies and the evils of an installed base.

Internally driven strategies are created on the belief that a vendor's previous success validates its right to a future. The mind-set evolves as follows:

- Our technology is selling, therefore it is good.
- Our customers like our technology, therefore they will buy more.
- Our customers like our technology, therefore other companies will buy it, too.
- Our installed base equals future opportunity.

If we move down market (cheaper) or up market (more expensive, faster) we can sell more to existing customers. We can't announce an innovative product in our core market because it will upset the installed base (a.k.a. cash cow). The inevitable result of internally driven strategies is that vendors start to contemplate their own navel. They evolve from being pioneers of new ideas to being the caretakers of an installed base. Because they think they are protected by the critical mass, they ignore new or radical technologies. After two or three reorganizations, the firm goes away.

Getting too big for your britches. When a vendor is successful in a niche, it begins to focus on what it wants to be, rather than what it is. This illness is usually expressed in grandiose corporatese about new market opportunities or strategic investments for the future. Forget it. If it isn't a lateral or down-market extension of the core business, it isn't going to work.

Firms that get too big for their britches usually catch the disease by focusing on only one or two competitors. As they win against the bigger giant, they begin to believe that other markets are theirs for the taking as well. This can be the kiss of death.

Surviving the exodus. One of the legacies of success is that vendors usually forget how hard it was to achieve. One reason is that nobody is left. Senior executives are wooed away to other companies that promise to make them president. Salespeople who pioneered the concept retire on their earnings or go to other companies that can offer them a better deal.

The result of this exodus is that the company loses the experience of history and the reasons for its success.

Arrogance. Face it, arrogance begins at the top and works its way down.

There is a fine line between arrogance and esprit de corps. Esprit de corps is created when there is a common enemy and the company is gaining momentum. Esprit de corps turns into arrogance when the enemy is vanquished and no other competitor comes to the fore.

The problem with arrogance is that it spreads like wildfire. Who needs to manage perceptions when the world is beating a path to your door?

Arrogance always comes before a fall, and the more arrogant the company, the harder it is hit.

Playing follow the leader. Vendors in the computer industry are a lot like lemmings with an unlimited number of cliffs. If it's a bad idea, you can be sure that everyone is doing it. If it's the wave of the future, look for one lone voice in the wilderness.

The problem with playing follow the leader is that the leaders in the computer business are pretty smart. They leak their intent to enter new markets and then charter skeleton organizations, which are hyped in the press. While competitors scramble to pursue the "opportunity," they sneak off to make money somewhere else. Face it, the big players didn't get where they are by telling everyone what they plan to do. They got big by weaving fantasies to keep competitors offtrack.

Fat marketing organizations. To check the health of any computer supplier, look at the head counts in marketing vs. engineering and the feet on the street. If marketing is bigger than either or both, you have a vendor on its way out.

Unfortunately, vendor success almost always translates into fat marketing organizations — thriving kingdoms where an ongoing game of Keystone Kops replaces innovation and original thought. Because the "customer" becomes numbers in a market research summary, strategies are designed with a shotgun. It's sure to hit something out there, even if it is wrong.

The results of fat marketing organizations are obvious. Products are thrown out to a progressively more confused audience, and even the smartest salesperson can't fill the void.

To avoid fat marketing organizations, vendors should consider installing a revolving door. Marketers whose products do not make the numbers get to spend a fun-filled year in sales. That's a dose of reality that should clear the halls.

Gruhn is a consultant based in Mesa, Ariz.

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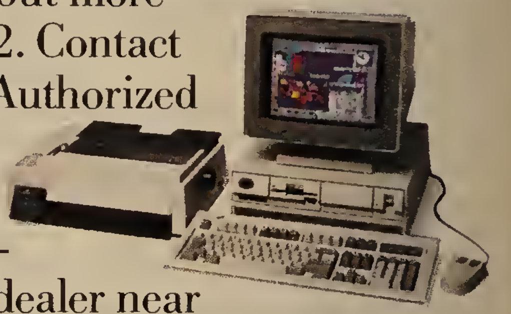

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SYSTEMS & SOFTWARE

COMMENTARY

J.A. Savage

This has gone 2 far

You may have read recently that the number $2^{512} + 1$ was factored by a mathematician in New Jersey using more than 275 "MIP years" (the work of a computer running at one million instructions per second [MIPS] for a year) on over 1,000 workstations.

The number takes up nine lines in a column this size and is 155 digits long — which is about all the math this reporter is capable of without a calculator. But why would anyone bother to factor such a problem to find what numbers multiplied together constitute the 155-digit result?

Arjen Lenstra, the man behind 2,424,833 times 7,455, 602,825,647,884,208,337, 395,736,200,454,918,783, 366,342,657 times 741,640, 062,627,530,801,524,787, 141,901,937,474,059,940, 781,097,519,023,905,821, 316,144,415,759,504,705, 008,092,818,711,693,940, 737, said that the resulting number, $2^{512} + 1$, was No. 1 on the Top Ten List of Most Wanted Numbers.

Never heard of the list? Lenstra said it's been around since 1924 in what's called the Cun-

Continued on page 34

Chipping away at a tough wall

IBM tries some new carrots to entice System/36 users over to the AS/400

ANALYSIS

BY MARYFRAN JOHNSON
CW STAFF

For two years now, IBM has been trying to lure a recalcitrant bunch of System/36 users over to its midrange darling, the Application System/400.

Even in cases where AS/400s have joined or replaced System/36s in the workplace, many users remain faithful to their old operating system by running certain applications in a System/36 mode on the AS/400.

By the end of this summer, however, IBM is expected to make yet another overture to the System/36 world with new, lower priced, entry-level AS/400s — at least one of which will run the System/36 operating system, SSP, in native mode.

Also in the wings is a new release of the OS/400 operating system, which IBM has been telling its business partners will be shipping before October. Release 3 of OS/400 is reportedly loaded with features designed to make the AS/400 a more palatable choice for System/36 users.

"Anything that makes it easier will be appreciated," said Beverly Brown, a technical analyst for AS/400 and System/36 systems at Kendall Co.'s adhesive plant in Franklin, Ky. Kendall's two plants in Franklin each use an AS/400 to run their payroll systems, while a manufacturing and data entry application resides on the AS/400 but runs in the System/36 mode.

"It is somewhat slower in the 36 mode, but the application requires System/36," Brown said, noting that her users are also more comfortable with the familiar System/36 operating system.

"IBM's challenge is to provide a real price/performance inducement to these System/36 people," said Carson Soule, president of Computer Applications Specialists, an IBM midrange software company in Beltsville, Md. "Their machines are easy to run. They're cost-effective, they're paid for, and large numbers of these users are not out of capacity yet."

By the end of 1989, there were 113,000 installed System/36s in the U.S. and 249,500 worldwide, according to International Data Corp. (IDC) in Framingham, Mass.

"It is that installed base where IBM realizes the bulk of its new revenue will come for the low-end AS/400 models," said Carolyn Griffin, an analyst at IDC. "The 36 base tends to be old Blue shops, very proprietary-based, very locked into IBM hardware and software."

Luring those System/36 users into the AS/400 tent is a market that analysts estimated at more than $10 billion, figuring an expenditure of $50,000 per site for each customer upgrading to an AS/400. Yet there is universal agreement that total conversion of System/36 applications to native mode on the AS/400 is a rocky trail of frustration and expense.

One way IBM has kept a hook in the promising System/36 base has been to create multiple operating environments on the AS/400.

Although OS/400 comes in only one version, it actually supports three different environments. The main environment is "AS/400 native mode," which includes a relational database management system, hundreds of system menus, a Help facility and other features.

The other two environments are layered on top of OS/400 — one for System/38s and one for System/36s — each allowing users to keep their old, familiar operating system while working on new hardware. This works tolerably well in the System/38 mode because its common heritage with the AS/400 makes the operational differences between the two machines minor, several analysts said.

However, the System/36 mode on the AS/400 has some legendary performance problems.

"We are rewriting everything in native mode because anything we run in the 36 environment is horribly slow," said Richard Deckard, vice-president of data processing for Atlanta-based Manheim Auctions, a division of Cox Enterprises.

"We were the rebels. Other [System/36 users] told us we were crazy to go native," he said. Starting with 27 System/36s, Deckard has moved all of his in-house-developed applications off nine of the machines and said he anticipates another year of work to finish off the remaining 18 System/36s.

The company is now using 15 AS/400s and seeing a "major difference in batch-type work," Deckard said. One program that used to take 10 hours overnight to run on a System/36 now takes 1½ hours on the AS/400 Model B45.

Moving between programs in

Continued on page 36

Low-end strength

In terms of units, the bulk of the 67,000 AS/400s sold since the product was introduced in 1988 have been lower end models

	U.S. shipments in 1989	Shipments worldwide in 1989	Total installed in U.S.	Total shipments worldwide
Model 70	700	1,850	700	1,850
Models 50 and 60	2,900	8,750	6,100	17,850
Models 30, 35, 40 and 45	6,100	17,500	10,100	28,600
Models 10, 20 and 25	4,800	14,900	7,500	23,100

Source: International Data Corp.

CW Chart: Paul Mock

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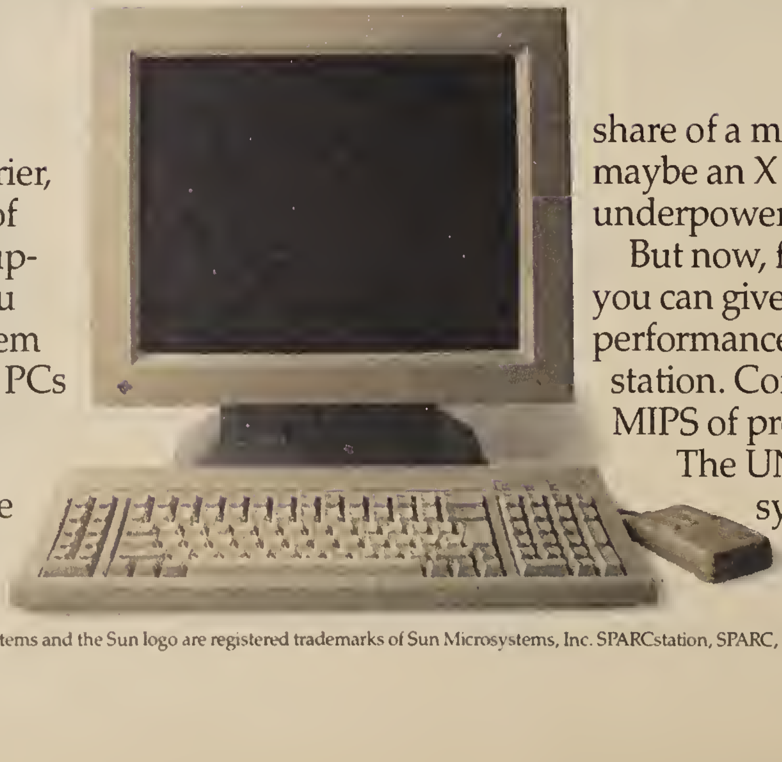

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SEE US AT DECWORLD '90

A brief season of Goodwill

Coordinating IS services for Goodwill Games Seattle was no easy task

ON SITE

BY J. A. SAVAGE
CW STAFF

SEATTLE — This information systems department will not last long.

In fact, IS services for the 1990 Goodwill Games Seattle, an international sports competition one-fourth the size of the Olympics, will only last from July 20 to Aug. 5.

Like those who train their whole lives for a few minutes of glory and perhaps a medal, Mike Mount and Jim Murray have been sweating behind the scenes for more than a year. Their conditioning program revolved around a number of steps, including the following: wrangling free systems from IBM and Apple Computer, Inc.; customizing software left over from the 1984 Olympics; training volunteers; making sure that the 14 venues for activities were spread throughout the state; and having the proper jacks and wiring.

With this logistical nightmare looming, Murray, who is the director of technology, said, "The most difficult work was to get sponsors." After negotiating with IBM for nine months and ending up with 300 personal computers, a 4381 and a System/38, he said that his most pressing problem now is to get skilled volunteers.

"There are two criteria: They must be in management and at a technology company," Murray said. He added that key people, such as data processing and networking managers from companies such as AT&T and The Boeing Co. were selected a year ago, and now these volunteers have been charged with recruiting others from their staffs to fill out the required 700 IS volunteers.

1990
GOODWILL
GAMES™
SEATTLE

Although the coordination sounds nightmarish, both Murray and Mount, vice-president of technology and communications, are swan diving into it for the second time — both had worked in somewhat the same capacity at the 1984 Olympics games in Los Angeles.

"The biggest change from the Olympics is the advances in PCs," Mount said. "The problem with software that existed in 1984 was that the biggest machine only had 256K [bytes] of memory."

The two biggest applications — accreditation for the 2,600 athletes, 1,500 news people, assorted coaches and other staff (adapted from the Olympics) and security — are run on the mainframe and the System/38, respectively.

Job orders for the 12,000 volunteers and inventory for everything from cellular phones to towels are run on PCs. The PCs also schedule transportation for the 10,000 people from 52 countries expected to fly in for the games, which is among their more mundane uses. The Apple computers are primarily used for desktop publishing. "Without PCs, this place would be dead," Murray said.

Another innovation is the use of read-out pagers as receiving terminals for results. The pagers can be hooked up to printers for hard copy, according to Mount. With the pagers, results of competitions such as ice hockey and women's volleyball held hundreds of miles away can be transmitted without expensive communications equipment.

Three to four days before the events start, the organizing committee will have access to the venues to install terminals, copiers, printers and phones with special jacks for journalists with computers. "You don't have time to get the glitches out," Mount said.

A depressing lull follows this frenzy of activity, the two men said. "From the time the games start, there's nothing for me to do. I feel like the Maytag repair man," Mount said. Murray added, "It all just gets boxed up and sent back."

Hacker attacks can be hazardous to health

BY MICHAEL ALEXANDER
CW STAFF

Hospitals are rushing to automate patient records as a way to ease the economic and administrative burdens of storing and using records on paper. While that may be good for business, it poses security headaches for health care information systems professionals.

In general, "the security of hospital information systems is poor," according to Jaime Taaffe, director of computing for the department of radiology at Massachusetts General Hospital in Boston.

No system is completely immune to a discontented insider or a determined hacker, should one or the other decide to alter a diagnosis or treatment procedure hoping to cause bodily harm, said Richard Sneider, president of Sneider & Associates Ltd., a Newton, Mass., consulting firm specializing in hospital information systems.

The safeguard is that medical staffers would questiōn whether an altered procedure was appropriate, he said. "There have been cases where a computer system didn't correctly report the required blood type for a transfusion and the patient died at a large county hospital," Sneider said. "In theory, a hacker could do the same thing, but to my knowledge, there has not been a case where that has happened."

Outlaw hackers have penetrated hospital computer systems, altered patient data and caused other sorts of high-tech mischief. The attacks, while serious, apparently have not resulted in injury to patients.

About two years ago, hackers illegally accessed a computer system at Barrow's Neurological Institute of St. Joseph's Hospital in Phoenix.

"It was a research database that was invaded," a hospital spokeswoman said. "The computer did not contain patient records. None of the information was stolen, but it caused some problems in accessing the database."

A subsequent investigation resulted in the arrest of two hackers last year and culminated in May with a nationwide federal crackdown on computer crime, code-named Operation Sun Devil.

Health care IS managers are forced to walk a tightrope between accessibility and security of patient records, Taaffe said.

For the information to be useful, it must be readily accessible to an ever-growing number of professionals who are responsible for the care of a patient.

However, the same information must be well guarded, not only for the sake of the patient's privacy but also to make sure that it is not unknowingly altered, he said.

"The data that resides in hospital computers — patient demographics, complications and diseases, such as [acquired immune deficiency syndrome], hepatitis and herpes — can have a major impact on individual life," said Ash Dave, vice-president of information technology at Cedars-Sinai Medical Center in Los Angeles. "If the data or analysis is not accurate, the implications are far more serious," he added. "If the information gets out in the wrong hands, it can have a drastic effect on patients and physicians."

Compared with keeping records on paper, information systems are significantly more secure, said Mark Schneider, national manager of health care information systems at Arthur D. Little, Inc. in Cambridge, Mass. "They are not as tight as banking and some governmental systems, but the flip side is that it would be inappropriate if they were," he said.

Some hospital IS managers said that because of the potentially disastrous consequences of not adequately protecting their data, they are more active in promoting proper security procedures among their end users.

"My major concern is that after taking all precautions, we still never know who can turn loose on us," Dave said. "When a report gets out into the user area, the user is really in control of that information. Data processing cannot do anything if the user decides to give the information to someone else or if someone gets a listing of AIDS patients at Johns Hopkins and sells it" to an insurance company.

Policing information stored on stand-alone personal computers is one of the trickiest parts of the security job, he added.

However, most major hospitals are also wrestling with interconnecting patient accounting, materials management, radiology and a wide variety of other applications into seamless, hospitalwide networks. The goal is to have a completely automated record of the patient from admission to checkout and even beyond. Increasingly, these networks are also being extended beyond the boundaries of the hospital to affiliated hospitals, research institutions and others.

> "THE security of hospital information systems is poor."
>
> JAIME TAAFFE
> MASS GENERAL

In stitching together these internal and external networks, security standards may not be uniformly applied, again contributing to security gaps.

"Have we had people try to break in?" Taaffe asked. "You bet. We need to be on these nets, but we don't want to be."

Most institutions can protect themselves from the casual hacker, however.

"To protect against a determined hacker costs over a million dollars, and even in that case, a person familiar with the system such as a disgruntled employee can still do damage," Sneider said. "Luckily, the most disgruntled employees have done so far is to damage financial records."

HARD NOTES

DEC upgrades Microvax II

Digital Equipment Corp. recently announced a $20,000 integrated systems package that allows users to upgrade their Microvax IIs to high-availability, dual-host systems with automatic fail-over. DEC claimed the package will more than triple the processing power of Microvax II configurations. The dual-host machine is a pair of Microvaxes linked with a special bus — the Digital Storage System Interconnect (DSSI). The upgrade packages, available now, include a new Microvax 3300, DSSI bus adapter, cabling, associated software licenses and a choice of various storage elements.

Smartstar Corp. and **DEC** have announced a cooperative selling agreement under which DEC salespeople will sell the Smartstar application development software directly to customers.

In another reseller agreement, **DEC** and **V.I. Corp.** in Amherst, Mass., have announced that they will jointly market V.I.'s Dataview family of graphical user interface development tools.

EMC Corp. has announced a marketing agreement with **Intelogic Trace** in San Antonio under which Intelogic will sell all of EMC's Wang Laboratories, Inc.-compatible storage products to users of Wang VS minicomputers. Intelogic is a third-party maintenance company with approximately 200 U.S. locations. EMC, based in Hopkinton, Mass., will continue to market its storage products to Wang customers.

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The On-Line RDBMS

The Sybase View

Business critical on-line applications can dramatically affect the competitiveness of an organization. They require an on-line RDBMS architected to integrate real-time decision support and transaction processing across networked environments.

Historically, RDBMSs were designed only for decision support applications. Many vendors have tried to extend their architecture for on-line capabilities, but lack features critical to success. A true on-line RDBMS demands superior performance, integrity, availability, distributed data management, and integrated tools.

SCALABLE HIGH PERFORMANCE

For the best price performance and absolute performance, an on-line RDBMS must scale up, or down, as business needs dictate. Only an on-line RDBMS with a multi-threaded programmable server architecture has proven successful in handling peak loads, with subsecond response time, for large numbers of users, on a variety of platforms.

SERVER-ENFORCED INTEGRITY

An on-line RDBMS must enforce data security and integrity rules, including referential integrity, *in the database* rather than in each application. This requires an intelligent, programmable server architecture. This architecture dramatically reduces enterprise-wide application development and maintenance time while improving protection and data consistency.

HIGH APPLICATION AVAILABILITY

An on-line RDBMS provides high application availability to avoid costly downtime. It performs backups, recoveries, and database administration changes while applications continue to run. And it supports fault-tolerance with mirrored logs and databases, as well as multi-CPU recovery to minimize exposure to hardware problems.

OPEN DISTRIBUTED DATA MANAGEMENT

An on-line RDBMS fully supports an open client/server architecture that lets you transparently distribute applications and databases over networks of multiple heterogeneous workstations and/or computer systems. It includes a two-phase commit service to support distributed update transactions, as well as retrievals, across two or more servers. And it provides open interfaces for integrating third party tools as alternate clients and foreign data sources as alternate servers for a truly open computing solution.

ADAPTABLE WINDOWING TOOLS

An on-line RDBMS gives developers a set of window-based 4GL tools that are object-oriented, event-driven and portable. And it integrates these tools with the power of the programmable server. In addition, an on-line RDBMS gives users a set of window-based decision support tools that provide real-time access to live data with a highly intuitive graphical user interface.

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SYBASE preserves and protects your hardware and software investments while allowing your organization to grow. SYBASE gives you window-based decision support tools along with a powerful, integrated 4GL development environment; you write applications once and know that they're fully portable to a wide variety of platforms. And SYBASE provides an open client/server architecture that fulfills the promise of the on-line enterprise.

SYBASE. Architected from the outset as the on-line RDBMS.

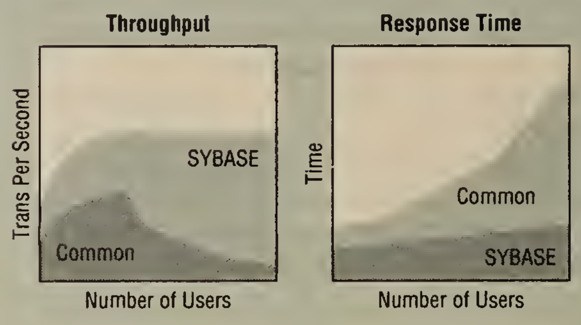
THE SYBASE FORUM

This view of The On-Line RDBMS first appeared in The Sybase Forum (Computerworld, April 2, 1990).

We'd Li Perspe The O

SYBASE SQL Server® delivers the high throughput and fast response times needed for on-line applications. Moreover, SQL Server maintains performance levels as the number of users and the size of the databases grow.

SYBASE performance is based, in part, on a multi-threaded server architecture that includes its own kernel and SQL task manager that are optimized to handle multi-user functions usually associated with the operating system. In addition, the SYBASE SQL Server architecture

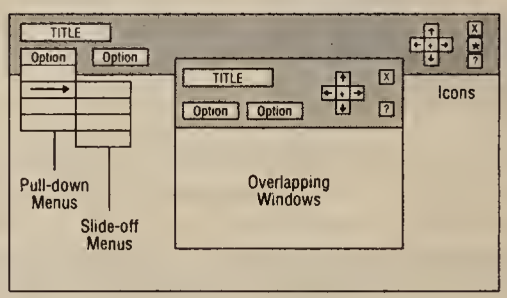


SYBASE maintains maximum transaction throughput and fast response times over an extended range of users.

The on-line enterprise cannot afford an RDBMS that must periodically be taken off-line for routine maintenance activities, such as database backups, diagnostics, design, and integrity changes.

SYBASE SQL Server allows all such activities to be handled on-line, with system-supplied stored procedures, while applications continue to run.

SQL Server also protects against hardware problems by supporting *software-based* fault tolerance with mirrored logs and databases, as well as multi-CPU recovery.



SYBASE provides a highly intuitive graphical user interface to maximize productivity for developers and end-users alike.

SYBASE boosts productivity with powerful window-based tools that meet the needs of all users. Programmers get a state-of-the-art fourth generation language (4GL) programming environment. Overlapping windows, pull-down and slide-off menus, and icons help developers build complex, on-line applications in a fraction of the time it takes using traditional tools.

In addition, SYBASE offers a complete SQL life-cycle toolset for developers. All phases are supported, including design, prototyping, development, testing, administration, and maintenance.

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n-Line RDBMS.

has been extended to take full advantage of symmetrical multiprocessor (SMP) hardware systems. The resulting benefits are greater throughput, more effective load balancing, extended multi-user capacity, and efficient operational control.

In Computerworld (March 5, 1990, "Buyer's Scorecard") SYBASE ranked first in eight out of eighteen categories, including "Performance in processing on-line transactions" and "Performance in decision-support applications."

One of New York's most respected investment research and management companies, Sanford C. Bernstein & Co., chose SYBASE because "Of all the systems we evaluated, SYBASE was clearly the fastest. It accommodated multiple users without losing performance and offered the most functionality both on the transaction processing end and the data management end."

The on-line enterprise demands data and application integration and interoperability in a multi-vendor environment — *SYBASE Open Client/Server Architecture provides exactly that.*

SYBASE Open Client permits the use of a variety of front-end tools or applications, including SYBASE applications, independent software vendor's tools, and user written applications. SYBASE Open Server can seamlessly integrate hierarchical and relational DBMSs, third-party applications and real-time data feeds into SYBASE applications.

General Logistics International (GLI) is using SYBASE to help manage and distribute the volumes of data generated daily by one of the largest and busiest container carriers in the shipping industry— Mitsui/O.S.K. Lines North America. "The ability to distribute data among various locations combined with flawless data integrity when distributing that data was key to choosing SYBASE."

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This is what InfoWorld (March 5, 1990, "Dueling Servers") had to say about SQL Server's referential integrity: "The more power a multiuser relational database system has, the more potential there is for disaster. If you change a number on one table, any other table that depends on it may need to be changed. The risk lies in the failure to update all the appropriate related tables. The likelihood of this increases even more as more front-end applications that access the same data are added to the system.

"SQL Server offers effective countermethods. Its triggers, a type of stored procedure that executes whenever a given condition occurs, are attached physically to a table…and check all updates, inserts, or deletions for their effect on related tables. Since the trigger is installed at the server level — and not run through the front-end application — it doesn't matter which application updates the critical table. This is a critical feature as front ends multiply, and the potential for mismanaging data is increased. And since a given trigger need only be written once, at the server, it makes data integrity programming easy."

A final note: InfoWorld rated SQL Server referential integrity "excellent."

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Publishing house rewrites the book on systems

Harcourt Brace Jovanovich's renewed focus and homegrown system bring a happy ending

ON SITE

BY SALLY CUSACK
CW STAFF

ORLANDO, Fla. — Publishing conglomerate Harcourt Brace Jovanovich, Inc. (HBJ) is falling on better times. By selling all of its theme parks last year — including Cypress Gardens, four Sea Worlds, and Boardwalk and Baseball — the corporation eliminated an $875 million bank loan and turned its full attention back to what it does best — publishing textbooks.

HBJ's Byrnes *had a lot of management support*

Michael W. Byrnes, vice-president of MIS at HBJ, is the man ultimately responsible for merging and maintaining the firm's 400,000 accounts. The company produces textbooks for kindergarten through college levels and has customers in the retail, academic, dealer-distributor and international marketplace. A few years ago, HBJ envisioned one order processing system for all accounts.

"We acquired publishing group Holt Rheinhart & Winston back in 1986," Byrnes recalled. "And that gave us three different order processing systems: a homegrown one we'd developed, an academic one, and the one Holt had been using. We needed something generic to [meet] the needs of the entire company."

To merge the accounts, HBJ decided to develop a new system in-house, using computer-aided software engineering (CASE) technology. The two existing HBJ systems were each over 20 years old, and the Holt Rheinhart & Winston software dated back to 1980, recalled Dan Donovan, HBJ's director of production support.

"The cleaner direction was to re-engineer the application for the needs of the business today," Donovan said. "It was in 1987, and we also brought in DB2, as well as Cobol 11, as new tools, and we relied on our existing data processing staff."

He added that HBJ experienced the problems that are typical of any shop going from a maintenance to development environment, and "we got some employee resistance to the new methodologies for program development installation and things like that."

The ultimate product was dubbed COPS, for Customer Order Processing System. Programmed in Cobol II, the COPS software is DB2-compatible and runs off the company's Amdahl 5890 300E mainframe under IBM's MVS/XA.

The preliminary system design work was done using Foundation, Arthur Andersen's CASE product, with the detail and programming design handled by the HBJ staff. Arthur Andersen also serves as the auditor for HBJ, and having established contacts at each company made for a natural working relationship.

Byrnes described the COPS system as in "quasi-production" mode at present, getting fixed up for the full production installation scheduled for early November. In hindsight, he said he feels the company should have started with a smaller project.

"COPS in itself is the largest single system HBJ has ever written. It is the front end for all order processing, has a million-plus lines of code and includes 450 programs that operate in on-line, batch and reporting mode," he said, observing that at the outset, the complexity of the project was not completely understood. "We should have spent more time studying," he admitted.

With a local-area network used for the development piece of the project, there are currently 22 persons of the 122-member data processing staff involved in COPS development. Initially, the product was programmed using temporary programmers for cost-effectiveness.

"The happy ending here is that, besides the system, we have had a lot of support from management. They were very much involved in the needs of the project and have learned that data processing isn't a 1-2-3 business; it takes a lot of time and effort and understanding."

Management understanding is important to a shop the size of HBJ's. With 1,200 employees at the Orlando, Fla., office, and a total of almost 6,000 nationwide, the organization has 950 users linked to the mainframe system over 56K and 9.6K bit/sec. leased lines, and there are approximately 1,000 stand-alone IBM Personal Computer-compatibles scattered about. The company recently replaced coaxial with balons cable for quicker and cheaper installation of terminals, and it is also looking toward building an overall network for cost-effectiveness in the future.

Keeping the equipment up and running is another concern for Byrnes. Referring to southern Florida as the "lightning capital of the world," he has taken precautions to isolate the data center operations from any form of outside interference. The two-foot sink floating floor includes sump pumps, and halon systems are installed in the ceiling.

HBJ uses Comdisco, Inc. for disaster recovery services, but according to Byrnes, the company fortunately has had no occasion to use them.

Byrnes said he firmly believes that the MIS group can contribute to the running of the business. "MIS departments should be proactive," he said. "Senior-level management is directly involved with us, as part of the mainframe operations and the CASE development project."

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VIKING
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Savage

CONTINUED FROM PAGE 27

ningham Project, and his number has been No. 1 since 1985.

"They always have a list of numbers they really want to see factored," Lenstra said.

This particular number has been relied on by banks and governments in encryption code because it's been so hard to crack.

So Lenstra the mathematician — not the spy or the thief — decided to crack the number to test his theory of factorization, developed at Bellcore, Inc. in Morristown, N.J.

He split the problem into subprograms to run on distinct processors, a kind of parallelization but with the processors in workstations spread all over the world. Most of the computers used were like Lenstra's own, a Digital Equipment Corp. Decstation 3100, in the eight to 10 MIPS range.

Runtime was donated by researchers who were interested in the result, according to Lenstra, as well as some at universities and at DEC.

For five weeks, those subprograms ran and when done, each would send in the data over electronic mail to the central gathering point in Palo Alto, Calif. The data was assembled on 700M bytes worth of tape and shipped to Florida State University.

There, a 64,000-processor Thinking Machines supercomputer chewed the information for three hours and spat out the three numbers above. (No. No. Don't make me type it over.) Again, Lenstra swears he never took time away from other research projects for the supercomputer run. "I think we got some time that would otherwise be for maintenance," he said.

Cracking the code

Two things resulted in cracking the code number, Lenstra says. First, he was able to parallelize his solution for factorizing numbers, and second, he was able to use the 64,000-processor machine effectively.

I'm trying hard to think of something positive to say about using all that development time and computer time to factor $2^{512} + 1$, and the only thing I can come up with is that highly specialized use of parallel computing is interesting because developing software with the ability to break up problems to run on many processors at once continues to be the drawback to high-performance parallel computing.

But that's about it. If the same effort was put into devising a more precise global weather model, humanity might have a better grasp of global warming, or scientists could use the computer time for molecular modeling that could help develop an acquired immune deficiency syndrome vaccine.

As it stands, it's a fine number in the annals of math history. But it's no longer No. 1.

Savage is a *Computerworld* West Coast senior correspondent.

CASE road rocky, but it goes to the top

BY NELL MARGOLIS
CW STAFF

Computer-aided software engineering remains the way to go, although the way needs to be paved by CASE success stories and patient managers who understand that the tolls are steep, the learning curves treacherous and the route longer than it looks at the start.

That is the consensus of a group of users contacted recently, 18 months after they were first featured in *Computerworld* as early implementors of CASE concepts [CW, Dec. 26, 1988-Jan. 2, 1989].

"CASE is a tremendously hard sell," said Judith Martin-Mitchell, vice-president of the First National Bank of Chicago, back in late '88. "At every step as you implement methodologies, new questions and problems appear — you need more understanding, more information, more management."

While the complexities of the CASE undertaking have not abated, Martin-Mitchell said recently, savvier, larger scale users such as First Chicago have learned to anticipate them and not be unduly discouraged or deflected from the CASE approach.

"It's not so hard a sell any more," Martin-Mitchell said. "Success stories help a lot."

At First Chicago, two CASE-enabled applications — a customer contact database and an overnight overdraft package — are currently up and running. The bank's happy experience, and its consequent willingness to forge ahead in CASE, can be credited in part to its software engineering team's continuing compatibility with tools provided by Texas Instruments, Inc. and to the fact that CASE has enjoyed early and consistent executive-level support, Martin-Mitchell said.

That top-down backing is indispensable to a successful CASE implementation was brought home the hard way at Bath Iron Works Corp. A CASE initiative under way at the Bath, Maine-based shipbuilding firm was derailed by hard times in its basic industry and new management that saw CASE as a dispensable luxury.

> "STAY SMALL FOR a while. You learn so much when you go through the whole life cycle, and everything you learn will be invaluable to you next time."
>
> JUDITH MARTIN-MITCHELL
> FIRST NATIONAL BANK OF CHICAGO

"CASE? You could say that it's sort of dead in the water here," business systems analyst Wayne Sanford said.

Also critical to First Chicago's success, Martin-Mitchell said, was the bank's decision to rein in the scope of its initial CASE project.

"Start small" is the advice she said she would pass on to companies contemplating CASE. "And stay small for a while. You learn so much when you go through the whole life cycle, and everything you learn will be invaluable to you next time."

Not only is "on-the-job training" the best way to become CASE-worthy, she added; it well might be the only way.

Kurt Wagner agreed. Eighteen months ago, Wagner, then a manager at the Seattle office of accounting and consulting firm Arthur Young, was an avid CASE supporter and was encouraged by the beginnings of a peer-to-peer educational effort. Now the founder/president of an 11-person systems integration firm, he is still a CASE booster — CASE credentials were among the attributes he selected for when staffing his start-up. But he said he now sees limits to the role that user groups will play in easing implementation.

"Grass-roots education is good, but I'm not sure that it's effective," Wagner said. "What we need are some large-scale success stories, broadcast broadband to everybody."

At Arthur Young, which has since merged with former rival Ernst & Whinney to become Ernst & Young, Wagner's successors and former colleagues are still pursuing CASE with a vengeance, both for internal development and as consultants.

"CASE-related projects are all that I've been doing for the last 1½ years, and that will continue to be all that I do," said manager Michael Blackman.

The merger, he said, merely intensified and focused the merging firms' respective efforts. Believing that a strong and consistent methodology is key to successful CASE implementation, Ernst & Young has now standardized on a refined and tailored version of Knowledgeware, Inc.'s Information Engineering Workbench offering — which it has repackaged under the name of Navigator — and has mounted a "very large internal training effort," Blackman said.

The state of CASE, Blackman said, "has changed enough over the past 18 months so that, as a consultant, I don't spend much time educating users. That's not an issue any more." Now, he said, "the issue is that companies have to get out of the mode of thinking in terms of just cutting costs through CASE."

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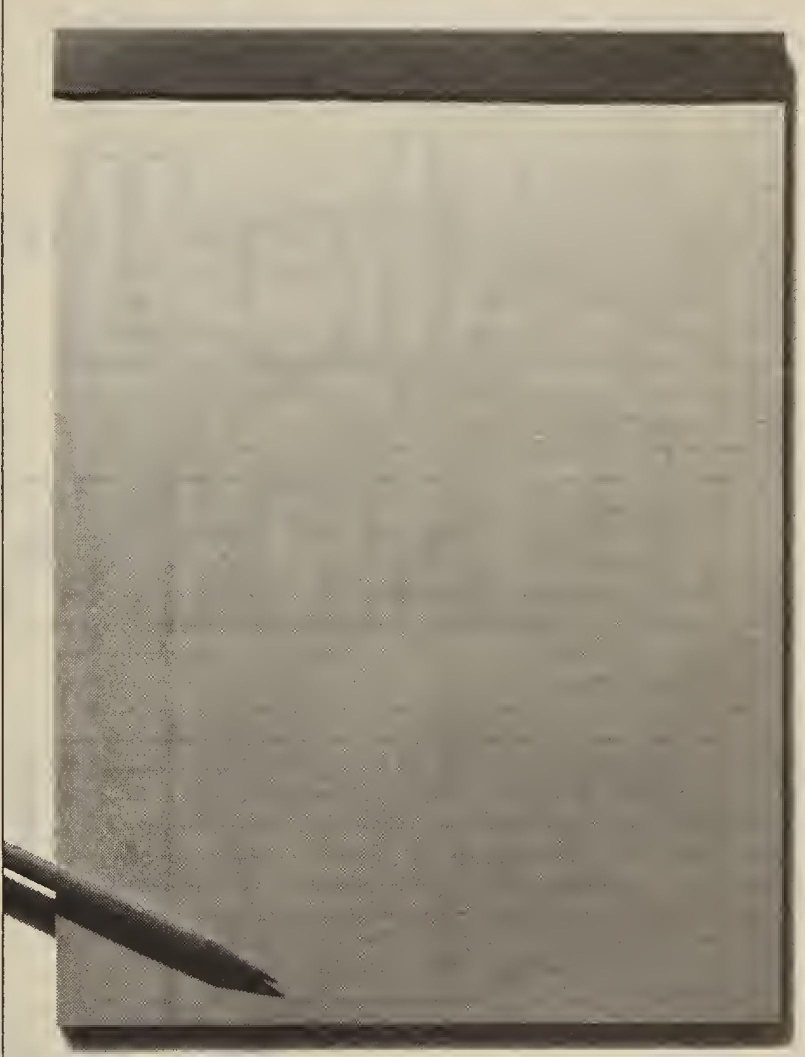

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CW0716

SOFT NOTES

DEC teams with Ross in global market

Ross Systems, Inc., a Redwood City, Calif.-based application software vendor for Digital Equipment Corp. VAX-based systems, recently signed an agreement with DEC that included plans by Ross to implement DEC's RDB database, RISC Ultrix and Network Applications Support software into its product line. The agreement also called for DEC and Ross to jointly sell selected products from both firms worldwide and for DEC to use certain Ross software packages in-house worldwide, according to Dennis Vohs, Ross' chief executive officer.

Cognos Corp. in Burlington, Mass., intends to to sell its application development and relational database management system to users of Hewlett-Packard Co. systems. Cognos Powerhouse software will be available for the HP 9000 Series 800. The Unix-based software will be offered as a full life cycle development environment, covering the various phases of software engineering and maintenance.

Andersen Consulting in Chicago said it plans to offer a service called Client Link that will give users of its Mac-Pac software access to on-line code modifications as well as a database of oft-asked questions and answers. The initial service is targeted at Andersen's customers running manufacturing, distribution and financial software on the IBM Application System/400 minicomputer.

Systems Center, Inc. and **Tandem Computers, Inc.** signed a deal that calls for the two firms to jointly sell systems and network management software to Tandem customers. The software will be based on Systems Center's recently acquired Netmaster management software.

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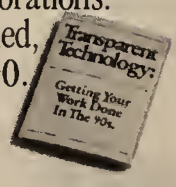

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IBM

FROM PAGE 27

the native mode and System/36 environment is often a tedious process, and the opening and closing of files from the System/36 mode "can drive the AS/400 nuts," said David Andrews, president of ADM, Inc., an AS/400 consulting firm in Cheshire, Conn.

While IBM has solved some performance problems, the ones left, Andrews said, include creating and deleting files, running batch work or data sorts in an interactive environment and signing on or off screens.

Analysts said IBM will clear up most of these difficulties with the System/36 mode through a facility in OS/400 Release 3. Operational Assistant is basically a set of screens that masks the complexity of native mode and mimics the simplicity of the System/36 operating environment.

Stalwarts of the System/36 insist that highly structured, professionally written code is what users need to avoid the performance problems in that environment. Properly used, the System/36 mode can give a user "everything that's native, plus a set of 36 compatibility functions," Soule said. The problem is, many System/36 shops are one- or two-person operations without professional programming expertise.

Consultants in the AS/400 and System/36 world recommend that applications be reviewed on a case-by-case basis to find the best candidates for running in the System/36 environment. "It's the bread-and-butter applications, the ones that get used every day and need to run as fast as they can, that should be rewritten in native mode," said Rodger Peck, president of the Peck Systems Group in Bridgman, Mich., a systems integration and consulting firm in Bridgman, Mich.

Peck said many of his System/36 clients will only be wooed to the AS/400 by lower prices on the entry models.

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NEW PRODUCTS — SOFTWARE

Utilities

The Workstation Group has introduced two Unix products designed for users of IBM mainframes who also want to use a Unix environment.

Uni-Xedit is a full-screen implementation of IBM's Xedit text editor that features an online Help system and more than 40 editor commands.

Uni-Rexx is a Unix implementation of IBM's Rexx system control language that offers extensive text parsing and string manipulation facilities.

Both products run on platforms such as Sun Microsystems, Inc.'s Sun-3 and The Santa Cruz Operation's Xenix. The products are sold for $399 each or together for $699.

The Workstation Group
6300 N. River Road
Rosemont, Ill. 60018
(708) 696-4800

Britz Publishing, Inc. has announced a bank account reconciliation system for maintaining accurate data about bank checking activities on an IBM System/36 or Application System/400.

The Recon system includes an RPG data entry program and IBM's Data File Utility. It also features an option to send follow-up letters to payees of checks that have been outstanding for a given length of time.

The product can track up to 999 bank accounts for 999 firms; it can also be used as a stand-alone unit or with accounts-payable systems, the vendor said.

Recon includes complete RPG source code and costs $99. A free 30-day trial period is included.

Britz
101 Old Canton Road
Madison, Miss. 39110
(800) 255-2028

Applications packages

Ace Microsystems Ltd. has announced LEX-WP Version 9C, an upgrade to its word processing and database management software package.

The product features pop-up menus, an integrated spell-checker, proportional space printing, an integrated database and a mail-merge facility.

Ace Microsystems' *LEX-WP features pop-up menus*

LEX-WP runs on Digital Equipment Corp.'s PDP and VAX computers, MS-DOS-based personal computers and Unix and Xenix systems. DEC system license fees range from $390 to $12,000. Licenses for PC- and Unix-based systems cost between $390 and $3,600.

Ace Microsystems
Kew Bridge House
Kew Bridge, Brentford
Middlesex, UK TW8 0EJ
(081) 847-4673

Data 3 Systems, a division of Ask Computer Systems, Inc., has introduced a line of Distributed Requirements Planning (DRP) and Sales Order Management (SOM) products designed for IBM System/38 and Application System/400 machines.

The new products include SIM/400 DRP, a facilitator for linking multiple systems, and Release 2.01 of its SIM/400 Manufacturing and Financials software package.

DRP products range from $20,000 to $66,000, and SOM products cost between $14,000 and $46,200, depending on type of AS/400 machine used.

Data 3 Systems
P.O. Box 441
2544 Cleveland Ave.
Santa Rosa, Calif. 95402
(707) 528-6560

Database management systems

The Answer Systems Division of Sterling Software, Inc. has announced Quick Query, a point-and-click menu enhancement for its Answer/Reporter Software database report generator.

Answer/Reporter Software is used to retrieve and format data from multiple databases on an IBM System/370 and plug-compatible mainframes and then display the data on an IBM 3270 terminal. Quick Query provides nontechnical 3270 users with an interface that enables them to use the data retrieval and formatting features of Answer/Reporter.

Pricing ranges from $6,000 to $15,000, depending on CPU configuration.

Sterling Software
21050 Vanowen St.
Canoga Park, Calif. 91304
(818) 716-1616

Computer-aided software engineering

Interact Corp. has announced the Interact Integrator, a data management framework for integrating computer-aided software engineering tools and other software packages in a networked environment.

Platforms supported include Sun Microsystems, Inc.'s Sun-3 and Sparcstation.

A single-user station that includes a user interface, automatic tool sequencing and comprehensive data management facilities costs $10,000. An integration station with all the features of the user station as well as a tool encapsulator sells for $30,000. The product is slated for a third-quarter release.

Interact
417 Fifth Ave.
New York, N.Y. 10016
(212) 696-3700

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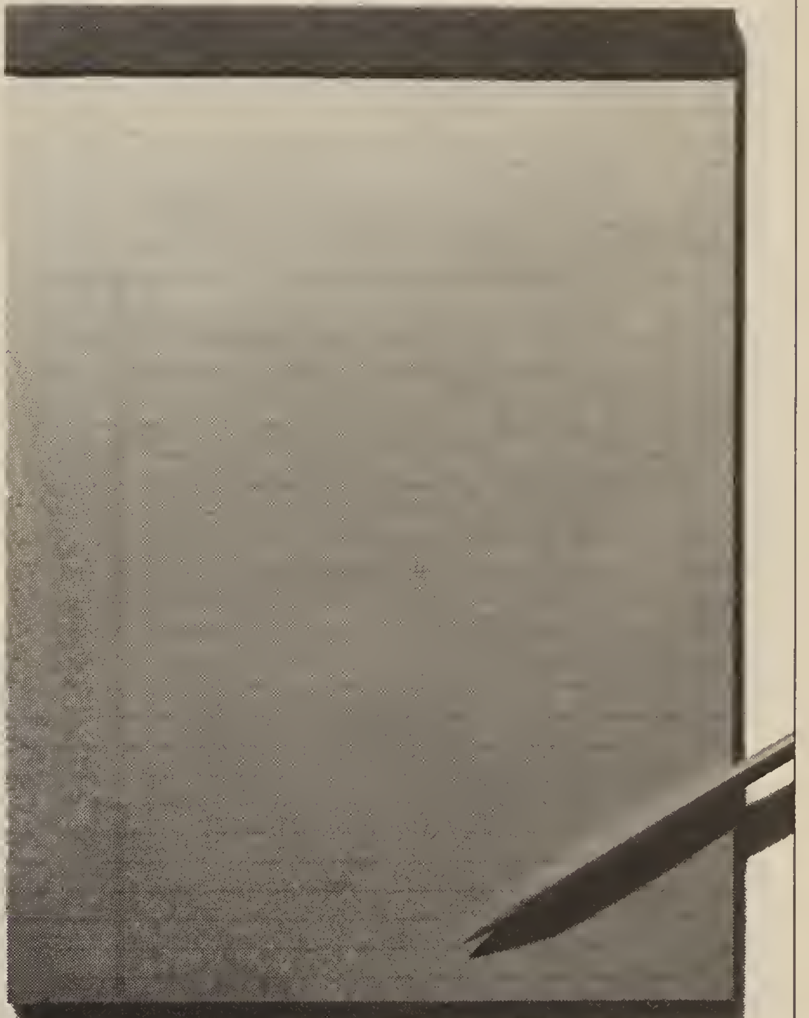

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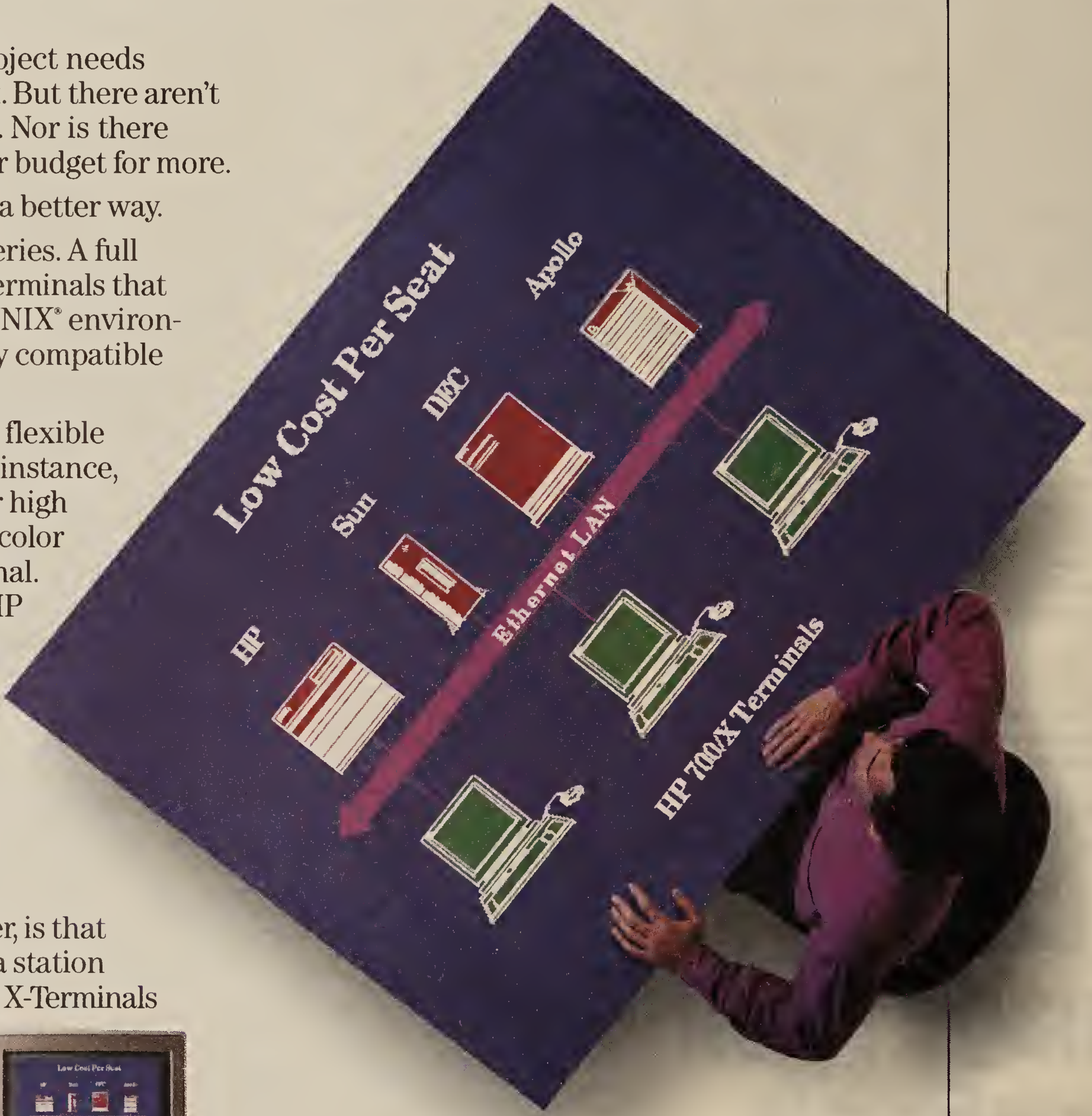

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NEW PRODUCTS — HARDWARE

Turnkey systems

KCR Technology, Inc. has announced a turnkey system that will print information in forms such as shipping tags, bar-code labels, packing slips and customer service reports.

The 7607 Remote Printing System was designed for high-volume remote printing from IBM mainframes operating under System Network Architecture. The system emulates the Remote Job Entry protocol to enable users to print at rates as high as 90 page/min., the vendor said.

The 7607 costs $124,450. Service rates start at $743 per month.

KCR Technology
One Riverview Square
E. Hartford, Conn. 06108
(800) 525-7055

Optigraphics Corp. has introduced a turnkey large-format document scanning system.

Optidraft was designed to meet the data-capture needs of mapping professionals, facility managers and mechanical and manufacturing engineers. Features include the ability to view images in real time while a drawing is being scanned as well as a two-dimensional computer-aided design package with drafting and database capabilities.

The system requires an IBM Personal System/2 or Personal Computer on the Intel Corp. 80386 platform. It sells for $100,000.

Optigraphics
9339 Carroll Park Drive
San Diego, Calif. 92121
(619) 292-6060

Processors

Lantronix has introduced a line of terminal servers that are compatible with Sun Microsystems, Inc. workstations.

The products are offered in four-, eight- and 16-port versions and are equipped with software that provides Sun workstation users with transparent access to file servers and remote network peripherals via Telnet and rlogin.

Pricing ranges from $1,495 to $2,495, depending on model.

Lantronix
26072 Merit Circle
Laguna Hills, Calif. 92653
(714) 367-0050

The Remex Division of Seymour Electronics and Automation, Inc. has announced a line of microprocessor-based shop terminals designed to provide multitasking distributed numerical control without a single point of failure.

The devices can be used as computer-integrated manufacturing (CIM) subsystems in high-level networks or as stand-alone DNC systems at manufacturing firms that are not ready to use CIM. Each terminal reportedly includes a multitasking machine interface unit and a separate, interchangeable operator interface.

The terminals range in price from $1,000 to $4,000, depending on configuration.

Remex
1335 S. Acadia
Fullerton, Calif. 92631
(714) 535-4160

Data storage

Ten X Technology, Inc. has introduced an optical-disc subsystem that enables users to read and write erasable and write-once, read-many optical media using a single drive.

The Opti Xchange subsystem includes a multifunction 5¼-in. optical drive and a built-in hardware interface that provides connectivity without the need for software drivers. The product can store from 650M bytes to 1G byte of data per cartridge, depending on type of compression.

The subsystem is slated to begin shipping this month for $5,995.

Ten X Technology
4807 Spicewood Springs Road
Austin, Texas 78759
(512) 346-8360

Opti Xchange *can store up to 1G byte of data*

Clearpoint Research Corp. has announced the DCMS-TSB, an 8mm tape storage subsystem designed for Digital Equipment Corp. VAX 8000 and 6000 series systems.

The product provides users with emulation for DEC's Tape Mass Storage Control Protocol and serves as a third-party direct-attachment subsystem for DEC's VAXBI bus.

DCMS-TSB also features ports for up to seven tape devices and offers configuration and backup capacities ranging from 2.3G bytes to more than 14G bytes, according to the vendor.

The subsystem is priced at $17,850.

Clearpoint
35 Parkwood Drive
Hopkinton, Mass. 01748
(508) 435-2000

Zetaco, Inc. has introduced a data storage subsystem that provides users of Data General Corp. operating systems with a 4mm, 1.3G-byte cartridge for unattended backup of most 5¼-in. Winchester disk drives.

The SKT-1300 includes a standard small computer systems interface and a proprietary SCZ-4 controller. Other features include a fast file search that reportedly allows users to access file marks and record boundaries in less than 20 seconds.

The price is $9,195, and add-on drives sell for $5,675.

Zetaco
6850 Shady Oak Road
Eden Prairie, Minn. 55344
(612) 941-9480

Distributed Logic Corp. has introduced two series of storage arrays designed for Digital Equipment Corp. VAX systems.

The DA750 and DA850 feature respective disk storage capacities of 10.4G and 15.5G bytes. The products can be ordered with a pair of Exabyte 8200 8mm 2.3G-byte cartridge tape drives or with two Exabyte 8500 5G-byte tape drives.

List price ranges from $146,938 to $235,421, depending on subsystem model.

Dilog
1555 S. Sinclair St.
Anaheim, Calif. 92806
(714) 937-5700

I/O devices

Genicom Corp. has added two models to its 4000 series of line matrix printers.

Models 4410 XT and 4440 XT feature an optional correspondence font that provides twice the speed of near-letter quality printers, the vendor said.

Model 4410 XT lists at $6,195, and Model 4440 XT costs $7,795.

Genicom
Genicom Drive
Waynesboro, Va. 22980
(703) 949-1492

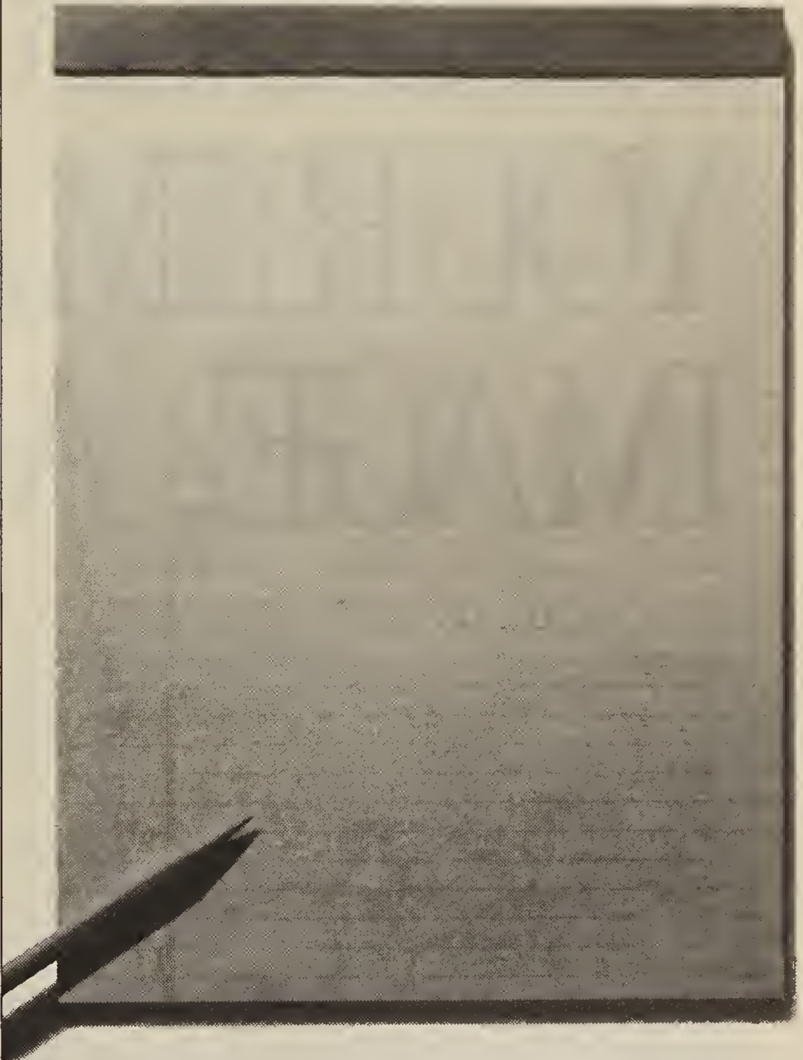
Maintenance equipment

On-Line Environment Corp. has introduced a failure avoidance system designed to detect environmental system problems in computer facilities.

Analysite collects measurements, such as the temperatures of magnetic tape or a freon leak in an air conditioner, at six times per minute and downloads the data for analysis. Maintenance personnel can access the data by dialing into an RS-485 network from IBM Personal Computers.

The service is aimed primarily at medium to large systems. It is being offered for $500 to $1,000 per month, depending on the size of the site.

On-Line Environment
1185 Chess Drive
Foster City, Calif. 94404
(415) 578-0480



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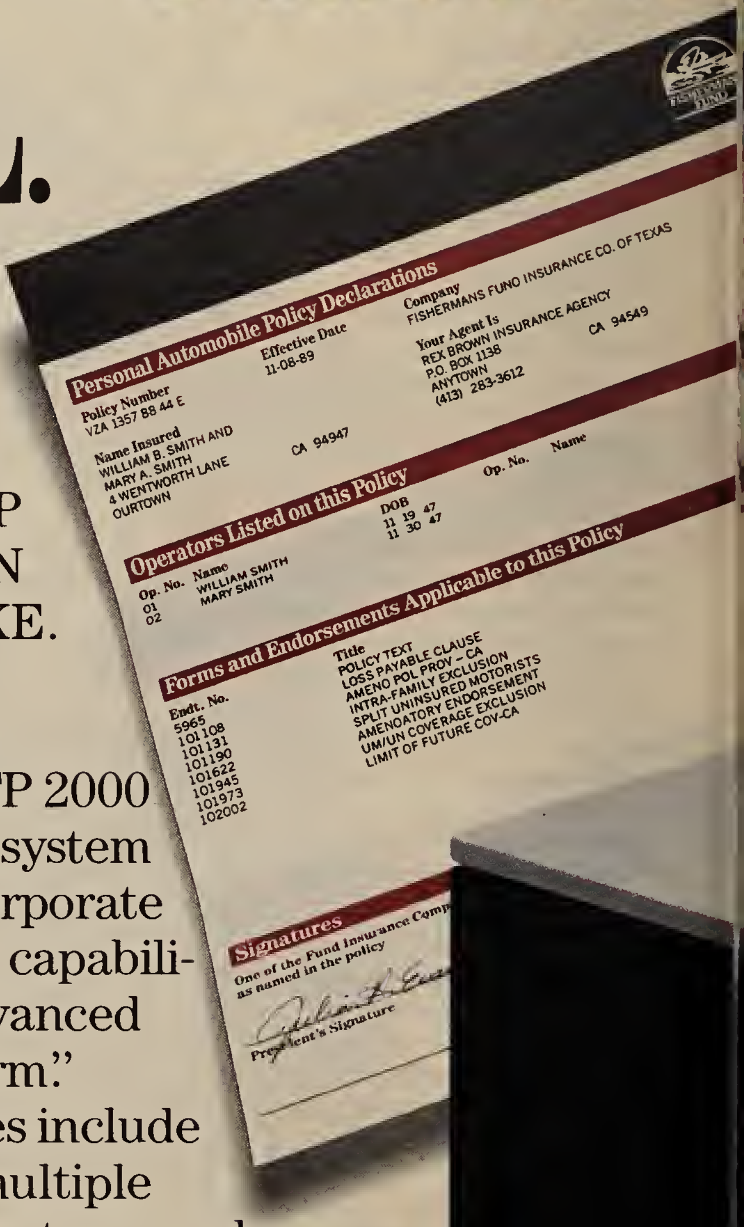

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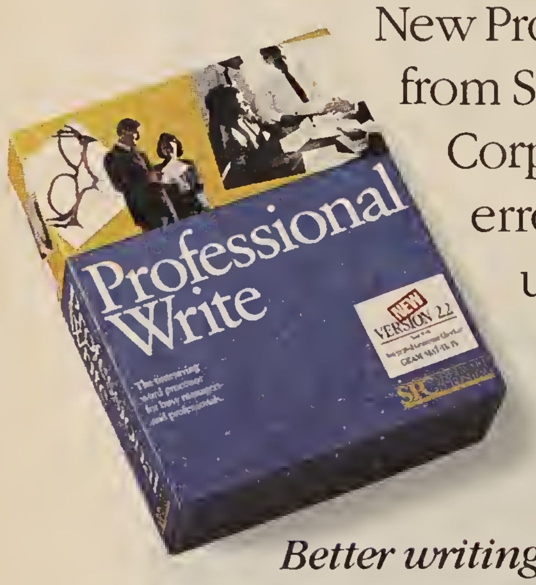

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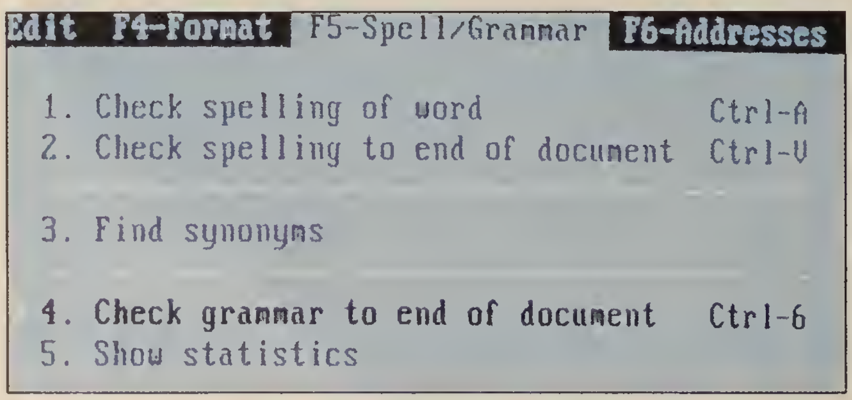

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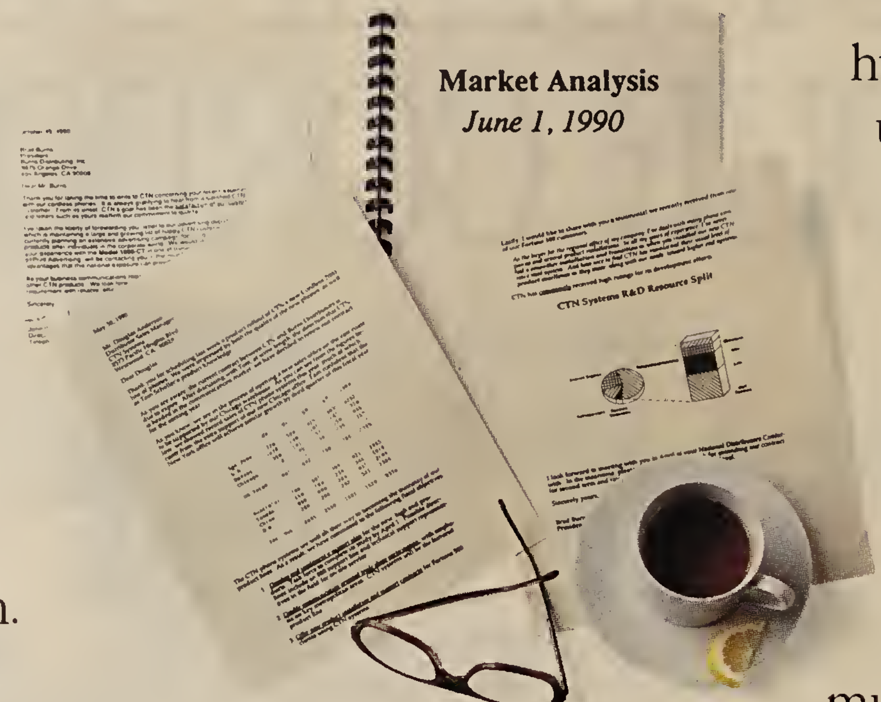

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Multimedia: A royal(ty) mess

ANALYSIS

BY JAMES DALY
CW STAFF

Putting together a multimedia presentation? Better round up the lawyers.

Experts said the dizzying montage of music, video and flashy images that has become the central charm of multimedia also harbors a decidedly dark side: Securing the copyrights for those myriad images has created a landscape peppered with legal sinkholes.

Gary Hare found out the hard way.

Hare is president of Fathom Pictures, Inc., a small Sausalito, Calif.-based production house that specializes in interactive entertainment and amusement park attractions. He has come up with the idea of putting together a product based on Rotisserie League Baseball, a popular game wherein baseball fans craft customized lineups from professional rosters and then engage in a season-long battle of statistics.

Hare wanted to mix images of the players with performance numbers and personal highlights, then spice it up with some music and old film clips. "It was an exciting project," he said.

That is, until he started talking royalty numbers to those with whom he would have to secure copyrights, including Major League Baseball (which wanted 10% of gross wholesale), the Major League Players Association (another 10%), music companies (3%) and publishing houses for statistics (another 5%), as well as television networks and the estates of deceased players. By the time the final figures were added up, property rights had gobbled up nearly 50% of wholesale.

"That's one game that never got off the ground," Hare said.

Hare's aborted game underlines a severe problem facing users in the burgeoning field of multimedia production. The concept of compensation and ownership is today's "single biggest issue in multimedia," said Sean Callahan, an executive vice-president at Savitar, Inc., a San Francisco-based company that develops technology for the electronic publishing community.

Multimedia production operations are suddenly finding huge and valuable amounts of time gobbled up with legal — not creative — issues. "It's not unusual for some shops to spend as much as half of their production time just securing copyright permission," said Nick Arnett, president of Santa Clara, Calif., Multimedia Computing Corp., which publishes "The Multimedia Producer's Legal Survival Guide." With each increase in the complexity of a multimedia presentation comes an exponential increase in the threat of litigation.

Legal minefield

The very characteristics that make multimedia unique also make it a legal minefield. Nearly every image, photograph, letter of a poem or note in a song is protected by a copyright, and there is no such thing as "permissible borrowing" — snitching one line from a poem here or three measures from a song there.

Arnett said that the first step in acquiring preexisting media is finding who owns the copyright. This can often be a sticky business, however. Some types of media (i.e., music) may have several owners, all of whom must grant permission.

It is also important to anticipate and describe all uses of the borrowed medium, so you will not be in a legal straitjacket if you decide to alter original production plans, Arnett said.

If you do not have a particular piece of media in mind, there are catalogs and directories available to help you find what you are looking for. Stock houses and rights and permissions professionals can also provide valuable assistance in locating and acquiring parts of your work.

Continued on page 47

FEATURE: TELECOMMUTING SUPPORT

Who bears the burden?

BY CAROL HILDEBRAND
CW STAFF

For the harassed individual struggling with the demands of a high-stress career and a backbreaking commute, working part-time from home can seem like a ticket to a simpler lifestyle. Many telecommuters say they gain time with family while improving their productivity and reducing stress.

Simple can become complex when telecommuters need system support, however. Such issues as who is responsible for equipment maintenance and repair as well as who pays for the equipment in the first place are

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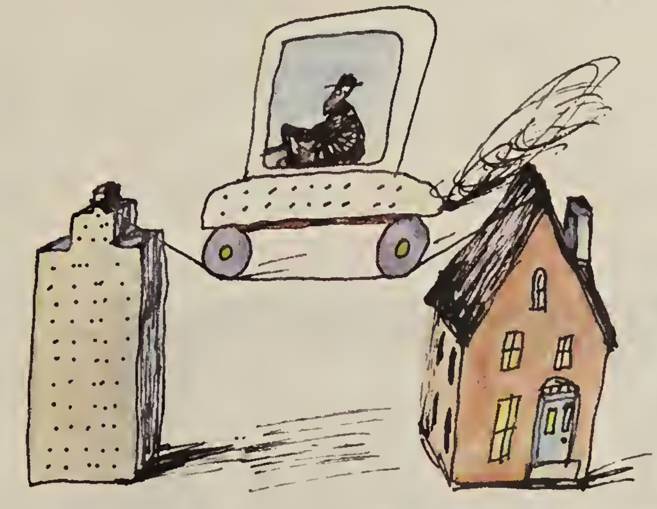

Blair Thornley

Is PC world getting flat?

BY J. A. SAVAGE
CW STAFF

Flat-panel displays could offer computer users a means to reclaim the desktop from boxy personal computers.

With VDTs approaching basic limitations in screen size and resolution, the American Electronics Association claimed that flat-panel displays will take over the market. "The CPU can plug into the display instead of a box," said James Hurd, president of Planar Systems, Inc., a Beaverton, Ore., display maker.

Memory would still take up other real estate for the computer, perhaps in a box set under the desk or a 2½-in. drive on the back of the display.

The reason such display/CPU desktop combinations have yet to appear in force on the market is that the U.S. flat-display industry is still in its infancy, with only about a half-dozen firms.

Pricing should not be a hurdle, however. Hurd claimed that a display/CPU does not have to be more expensive than current workstations. He estimated that an Intel Corp. 80386-based CPU/display combination would cost between $2,000 and $3,000.

"It's simple arithmetic," said Jim Kehoe, president of Plasmaco, Inc., a Highland, N.Y., manufacturer that started shipping display subassemblies in February. "We all have a high level of fixed costs, and as we work to get volumes higher, prices will go down."

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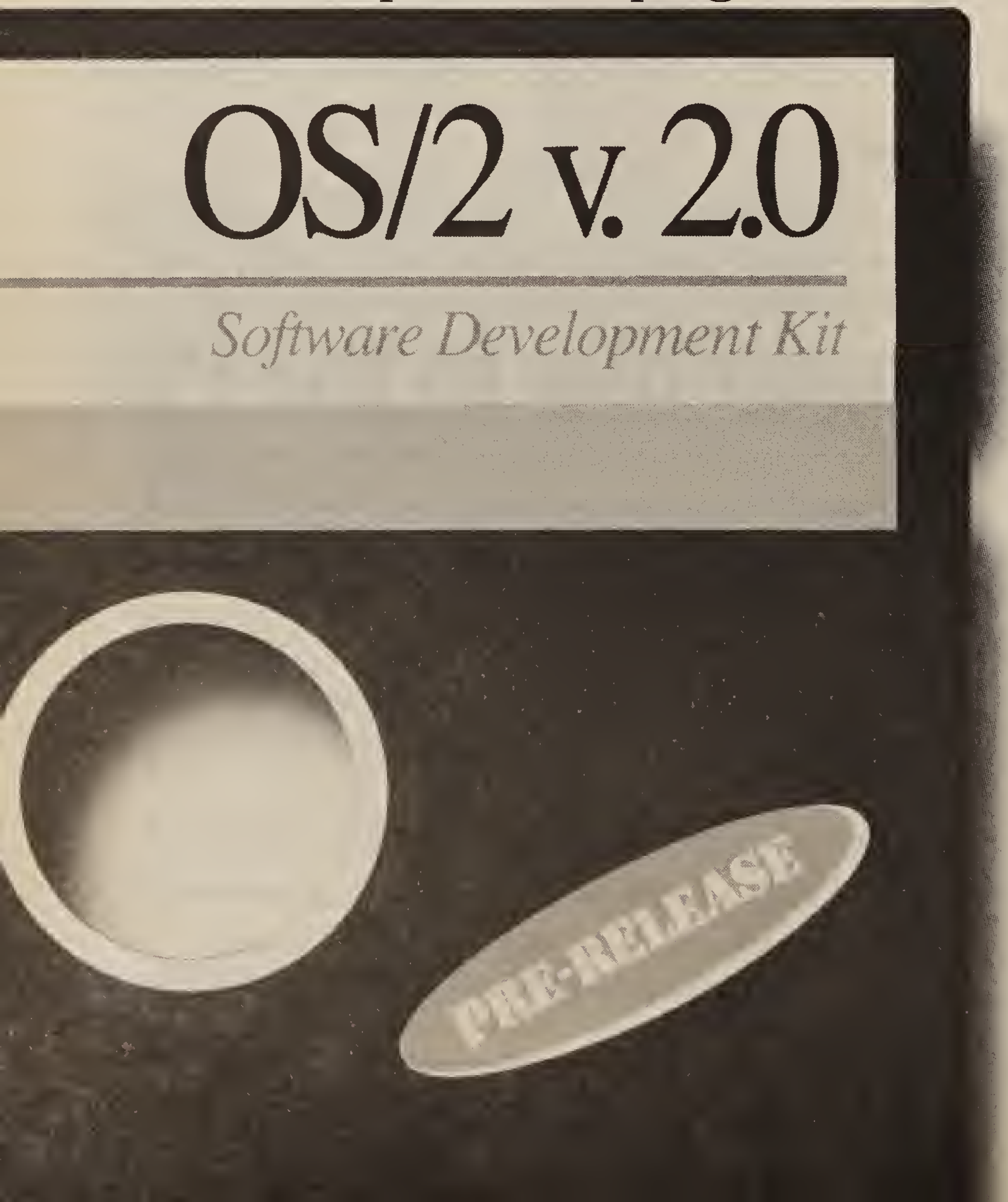

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COMMENTARY

Richard Pastore

Not much box for the buck

"They've come a long way from the PCjr," observers said after IBM introduced its Personal System/1 home computer late last month. I can vouch for that — I was a PCjr user for three years before I mercifully pulled the plug on that klunker and bought a Tandy 1000. The PS/1 that I played with at the press conference in New York was a vast improvement — but it was by no means perfect.

The chief problem is the price and value you get — or don't get — for your money. Forget about getting away for under $1,000. All you get for the $999 sticker price is a crippled base model with a black-and-white monitor, only 512K bytes of memory and no hard disk — an inadequate configuration for the kids who want to play colorful games and the adults who want to load Lotus' 1-2-3 or Microsoft's Windows. Plan on spending $1,700 to $2,000 for a truly useful base configuration. But wait — there's more. Because IBM foolishly chose to build a joystick port into a $250 adapter board rather than the back of the system box, adding a couple of joysticks for the kids will cost you an incredible $300.

So now we're talking serious bucks for a machine that isn't all that serious. Although it has Video Graphics Array resolution, the monitor you are forced to use is too small for serious desktop/home publishing use. Microsoft Works is a cute little all-in-one package, but work-at-home users might quickly find the functionality limiting. Prodigy, one of two on-line services IBM bundles with the box, has been almost universally panned for being too slow. The other, Promenade, seems likely to nickel-and-dime you to death with its 25-cents-per-minute prime-time charge.

Even novice users have enough common sense to comparison-shop. If they walk into their local electronics superstore, they may find out the PS/1 is not such a good deal. At a superstore like Lechmere in Boston, you can snag a Packard Bell 386SX with on-board VGA, hard drive, 3½- and 5¼-in. floppy drives, a modem, Prodigy, MS-DOS 4.1 and Lotusworks for $1,699. You can add a VGA monitor for $319.

Continued on page 46

Puette eyes integrated approach at Apple USA

IN PERSON

Two weeks ago, Apple Computer, Inc. filled a 5-month-old major hole in its corporate structure when it scooped Robert Puette from Hewlett-Packard Co. and named him president of Apple USA — the company's domestic sales, marketing and support division.

Puette, the affable former general manager of HP's worldwide personal computer group, has his work cut out for him. Apple USA has struggled through a prolonged period of weak sales and managerial turmoil, and its Cupertino, Calif.-based parent has been known to munch through its ranks like some folks go through salted peanuts.

Senior West Coast Correspondent James Daly recently spoke with Puette to discuss his plans for the division.

Where is Apple USA going in the next year, and how will you mix in your experiences at HP?

It's going to be several months before I can talk specifics about either products or channel directions. But I've spent nine years in the PC business at HP, which deals with the DOS world. I've learned a lot about what works in that situation and what doesn't.

Puette: *"I've got a very clear picture of what is needed"*

Culturally, the companies are similar: very intense people, who appreciate open communications, trying to make a contribution. A lot of these are Silicon Valley characteristics. Beer busts, for example: You talk beer busts to an East Coast company, and they don't know what that is. But everyone in the Valley knows what a Friday afternoon beer bust is. And it's a good communications vehicle.

Any changes organizationally so far?

[Chief Operating Officer] Michael Spindler has flattened the organization to the point where I have about 10 people that report to me. [Former Apple USA head] Allan Loren had three people reporting to him. Instead of having a single person worried about U.S. marketing, I have people who deal with channels — education, business, government. This gives me finer control.

What effect do you see Microsoft Corp.'s Windows 3.0 having on Apple?

Windows 3.0 brings the DOS world closer to the point-and-click environment of the Mac. That [actually] simplifies our marketing job. But the catch [for DOS users] is that the Mac is a plug-and-play environment. If you buy DOS you have to buy Windows separately, and then you're talking up to four hours of integration time. We'll need to play up that fact.

Europe has been tremendously successful during a period in which domestic revenue has been weak. Will we see the Europeanization of Apple USA?

I don't think so. The markets are very different, and you can't always apply what works in Europe to the U.S.

The U.S. is the largest homogeneous marketplace in the world. It's the only place where you can call 3,000 miles across the country and get a product shipped to you the next day. That doesn't exist in Europe, and I'm not sure it's going to exist after the economic reforms of 1992. You have to work with the situation you've got.

The sword of Damocles often hangs over the head of Apple USA. The average shelf life of an Apple USA president during the past five years was about 18 months. Does that worry you?

No. I've spoken with [Chairman and Chief Executive Officer] John Sculley and Michael Spindler, and I've got a very clear picture of what is needed. The sales, service and support organizations have not necessarily worked together over the last few years. We've got to bring that together. Various players in the past have had trouble doing that. Either they didn't understand the task, or they understood our customers but not how to manage our people, or they had trouble relating to the whole thing. I feel comfortable with all parts of the situation. I'm not scared — but maybe I should be.

No reservations about Unix

La Quinta Motor Inns checks in Xenix-based management system

ON SITE

BY MICHAEL FITZGERALD
CW STAFF

SAN ANTONIO — Between Labor Day 1989 and Mother's Day 1990, La Quinta Motor Inns, Inc. took the locks off of its doors.

La Quinta switched from a proprietary minicomputer-based system to Unix-based microcomputers.

The $200 million 205-inn chain opted for The Santa Cruz Operation's (SCO) Xenix/386 Version 2.3.2 running on Hewlett-Packard Co. Vectra RS/20 Model 154Es.

"We wanted to get into a standard environment, and to our minds, it had become more and more apparent that the Unix world was where everything was moving," said Michael Emmons, director of application development at La Quinta.

The company's configuration, unusual at the time when it was implemented in the summer of 1989, allowed it to keep the advantages of the Texas Instruments, Inc. 990 Model 673 minicomputers it began installing in 1980, when it first became automated.

"We didn't want to have a single point of failure that would shut the system down," Emmons said. The connections are made through a Corollary, Inc. 8x4 Intelligent Terminal Concentrator.

The Vectras serve the same functions as the TI machines: handling customer check-in, cashier functions, room inventory and reservations. Customized programs written for the TI system in Information Builders Microfocus Cobol/2 Version 1.0 have been translated to Xenix, and the hotel chain is currently in the process of writing new, more powerful applications for the system.

Najlah Feanny/SABA

Hamlett *is pleased with performance thus far*

Speed and functionality are the primary benefits La Quinta has seen so far. Each Vectra has 4M bytes of random-access memory. Another 4M bytes of RAM will be added in the near future. The TI machines offered only 64K of programmable RAM, which meant complex trickery was needed to get ever-more-complicated applications to run.

La Quinta estimated that it cost less to install the Vectras — each with three HP 700/44 terminals and three Okidata Co. Model 320 printers, plus bar-code readers and light pens — and translate all its software from TI's proprietary DS/10 environment to Xenix than it would to simply maintain the TI system for seven years.

La Quinta sends reservation and other information from its Unisys Corp. 2200/403 mainframe in San Antonio via a Telebit Trailblazer 19.2K bit/sec. modem. Two Unisys 6050 microcomputers serve to translate the mainframe information into Unix, using Unix to Unix Copy Program, after an earlier choice to use a Unix emulation tool proved ungainly.

Another early glitch was solved when SCO twice rewrote a Xenix device driver so that the Vectra's tape drives would work. The fast-paced installation — eight site conversions per week — went smoothly, with a three- to four-week learning curve.

While it is too early to say how beneficial the systems are, Charles Hamlett Jr., vice-president of information systems, said that applications have been greatly enhanced, including the addition of such features as improved room inventory, more consistent rate charges during promotions and improved sales and marketing tools.

Najlah Feanny/SABA

Emmons *aimed for a standard environment*

Hamlett said that within a year and a half, the company will upgrade to SCO Unix, which will allow it to explore DOS functions, X terminals, windowing and color terminals. When the company replaces its Unisys mainframe, it will switch to the Unix environment.

Said Hamlett, "We 100% expect [it] will carry us through this decade."

MICRO BITS

Good Word for Goodwill

The Seattle Organizing Committee (SOC) of the **1990 Goodwill Games** has announced that it will standardize on the following packages: **Microsoft Corp.'s** Word for Windows, Word Version 5.0 for the IBM Personal Computer and compatibles and Word Version 4.0 for the Apple Computer, Inc. Macintosh. The SOC is using over 300 IBM Personal System/2s and several Macs and wants to be able to share documents across different environments.

The **National Education Association (NEA)** said it will include **Microsoft Works** in its IBM PS/1-based NEA Edstar system.

The **University of California at Irvine**'s Executives MBA program has embraced the electronic notebook. Starting this fall and continuing throughout the next three years, graduate students entering the program will be outfitted with **Zenith Data Systems'** Minisport HD. The notebook computer will come preloaded with specific courseware, as well as word processing and spreadsheet programs. Faculty will also be issued systems.

Hoboken, N.J.-based **Stevens Institute of Technology**, said to be the first institution to require its students to lease or purchase a personal computer, has selected the **AT&T** 6286/EL and 638SX/EL computers for the incoming class of 1994.

Taco Bell, a unit of Pepsico, has closed an 18-month, $8.2 million contract with **Hewlett-Packard Co.** that covers 1,750 HP Vectra QS/16S Intel Corp. 80386-based PCs, software and printers. HP will install and service the machines in Taco Bell outlets nationwide and will automate back-office functions using 22 configurations of systems software, memory and hard drives. Effective use of the new system is expected to improve food costs by 1% and reduce the time store managers spend on administrative work up to 25 hours per week.

Zylab Corp.'s Zyindex has snagged a couple of government bids. The **Federal Bureau of Investigation** will use the product as a retrieval tool to assist investigators in case management. Support for a variety of word processing formats was a key factor in the FBI's decision. The **U.S. Department of Energy** has standardized on Zyindex for document classification and has used the product to create a user manual in comic book form, customized to its application.

First it was the free copy of the Magellan utility software for Trump Shuttle flyers. Now **Lotus Development Corp.** is teaming up with **Fuji Film**. Between Aug. 15 and Dec. 31, buyers of Fuji floppy disks will receive a trial version of Magellan 2.0. Stored on a free 11th disk, the Magellan sampler will be available in specially marked boxes of Fuji 3½-in. MF2HD and 5¼-in. MD2HD disks. Also included is a $25 rebate coupon good toward the purchase of Magellan 2.0. The package retails for $139.

Pastore

CONTINUED FROM PAGE 45

Craftier buyers will go grab a personal computer magazine and order from a direct-mail firm the same machine they saw in the superstore — for 33% less.

Does this mean the PS/1 will follow the PCjr into oblivion? It's doubtful. Big corporations don't like to make the same mistake twice. The PS/1 was clearly designed with at least some input from real-life people. The graphical user interface that cloaks the dreaded DOS prompt is a welcome inclusion. The built-in modem and the mouse are nice touches for the professional as well.

The most buoyant life vest that will keep this machine afloat, however, is its 100% DOS compatibility. If the memory requirements match, you can buy a PS/2 program for your PS/1 with full confidence, IBM claimed. That was hardly the case with the grossly incompatible PCjr.

Yet by making the PS/1 so compatible, IBM is taking a chance that the unit will impinge on its low-end PS/2 sales. This senior line offers more options for monitors, memory, expansion cards and operating systems; however, the two families are basically the same animal from a software standpoint. IBM deserves credit for not insisting on separating the two lines with a frustrating gulf of architectural differences as it did with the PCjr.

IBM executives acknowledged that there could be some cannibalization of low-end PS/2 sales but said they are not worried about any significant impact. Any PS/2 sales losses will be more than offset by PS/1 sales to first-time buyers who would not otherwise have considered any purchase. Pundits predicted 1991 PS/1 sales of 500,000 to one million.

Whether these sales materialize depends on how carefully shoppers look behind the PS/1's sticker price at the nuts and bolts they're getting for their bucks.

Pastore is a *Computerworld* senior writer.

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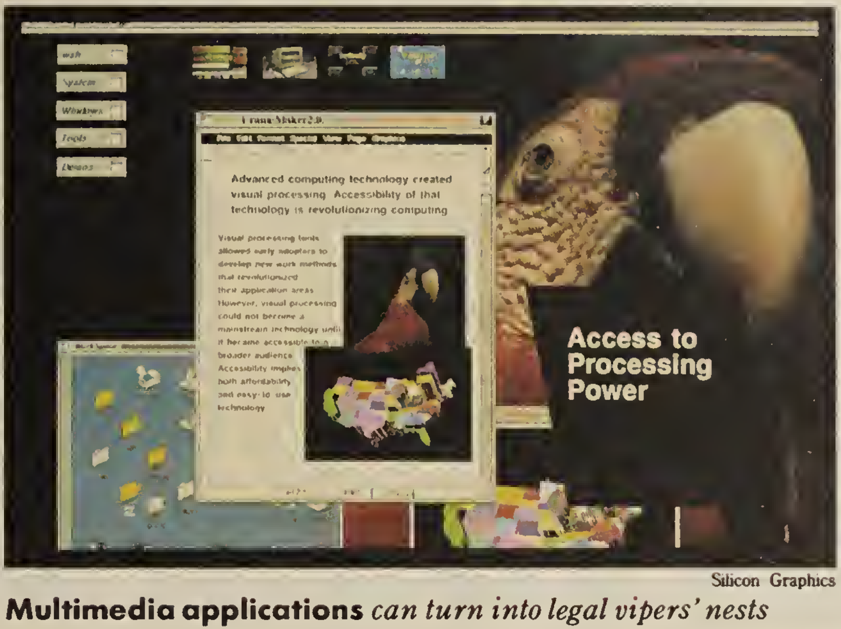
Multimedia

CONTINUED FROM PAGE 43

This legal tangle has spurred people like Arnett and Callahan to call for the formation of a copyright collective along the lines of what the Motion Picture Licensing Corp. does for the film industry or the American Society of Composers, Authors and Publishers does for the music business — provide a central clearinghouse for those who own information and those who would like to use it. "In that way, the user could pay a straight fee to the clearinghouse," Arnett said. "All the negotiations would be done beforehand. There would be no mess."

Until such a framework exists, however, Hare recommended that multimedia producers try to work with large publishing houses where one-stop image shopping can be done. "A place like Time-Life, for instance, can supply you with photos, film clips, nearly everything you need," he said.

Still, experts said that a large amount of people will continue to skip the process of securing copyrights because current social mores tacitly allow it. "We are not a copyright-conscious society," Arnett said. "We tape albums and movies without thinking twice about it."



Advanced computing technology created visual processing. Accessibility of that technology is revolutionizing computing

Visual processing tools allowed early adopters to develop new work methods that revolutionized their application areas. However, visual processing could not become a mainstream technology until it became accessible to a broader audience. Accessibility implies both affordability and easy-to-use technology

Silicon Graphics

Multimedia applications *can turn into legal vipers' nests*

With large media conglomerates roaming the land, however, it would only take a few copyright infringement lawsuits to sideswipe the fledgling industry. Conversely, image houses could lock themselves out of a fertile new area if they do not work with multimedia production teams that could make their old properties valuable again.

"There's still an awful lot of work to be done," Arnett said. "Now we just need to do it before the situation gets out of hand."

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*AIM Technology Suite III Benchmark, Dec 1989

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Wang seeks PC price edge

LOWELL, Mass. — Using price as the bait, Wang Laboratories, Inc. recently unwrapped two high-end personal computers based on Intel Corp. 25-MHz I486 and 33-MHz 80386 chips.

Starting at $8,595, the I486-based Wang PC 480/25C includes cache memory, a memory management unit and a floating-point processor built into its microprocessor. The unit's pricing is said to be comparable to that of Compaq Computer Corp.'s 33-MHz, 386-based Deskpro.

The Wang PC 350/33C features a 33-MHz, 386-based central processor, a chassis with a small footprint and costs $5,395 for a base unit. That pricing is comparable with many 25-MHz, 386-based PCs, Wang claimed.

Despite Wang's efforts to touch off a price war in what is mostly a DOS and OS/2 market, it is targeting the 480/25C at server, multiuser Unix host and technical workstation markets as well as at stand-alone users.

Wang said its 486-based box is sufficiently powered to handle the demands of multiuser computing and provides the flexibility needed to accommodate the large-capacity disk drives required by Unix users.

For example, the PC 480/25C employs 70-nsec standard single LU line memory modules to boost processor performance. All system memory is located on a single plug-in card to simplify memory upgrading and configuration.

The 480/25C base unit includes 4M bytes of memory, an on-chip 8K-byte cache memory, an on-chip numeric coprocessor, an eight-slot chassis with one parallel and serial port, a 1.2M- or 1.44M-byte disk drive and a keyboard.

The PC 350/33C base unit offers 1M byte of main memory, a 64K-byte cache memory, a six-slot chassis with one parallel and two serial ports, a 1.2M- or 1.44M-byte disk drive and a keyboard.

Both systems can support up to 16M bytes of memory.

To enhance system power and versatility, both systems can copy the BIOS and video programs from read-only memory into 32-bit random-access memory to speed up their operations, according to Wang. The PC 480/25C also caches the BIOS to increase system speed even more.

NEW PRODUCTS

Software applications packages

Computervision has announced Revision 4.0 of Microdraft, a two-dimensional design, drafting and detailing software package.

The product is available for personal computers running a DOS extender or Sun Microsystems, Inc.'s Sparcstation 1 workstation. Features include a library of commonly used cross-hatching patterns, the ability to use multiple text fonts with a single drawing and within one line of text and a utility that enables users to locate and remove all zero-length entities from a database in a single pass, according to the company.

Microdraft has a list price of $2,950.

Computervision
100 Crosby Drive
Bedford, Mass. 01730
(617) 275-1800

Structsoft, Inc. has announced Turbocase 2.0, an enhanced computer-aided software engineering program that runs on Apple Computer, Inc. Macintosh systems.

The software package includes a graphical interface with pop-up menus and an implementation of data modeling that features data-object behavior modeling (object-oriented analysis), which provides state transition diagrams for modeling the life cycles of data.

Turbocase 2.0 costs $995.

Structsoft
5416 156th Ave.
Bellevue, Wash. 98006
(206) 644-9834

Software Publishing Corp. has announced an upgraded version of its business presentation graphics software package.

Harvard Graphics 2.3 integrates Draw Partner, a high-end drawing accessory, and introduces Hypershow, a feature that allows business users to customize the flow of a presentation during a screen-show delivery.

Harvard Graphics 2.3 for IBM Personal Computer XTs, ATs, Personal System/2s or compatibles costs $495. A local-area network version, Harvard Graphics 2.3 LAN, requires a network server with a hard disk, 640K bytes of memory and DOS 3.1 or higher.

Pricing ranges from $375 to $1,875, depending on configuration.

Software Publishing
1901 Landings Drive
Mountain View, Calif. 94039
(415) 335-6440

Macintosh products

White Pine Software, Inc. has announced an upgrade to its series of terminal emula-

Laptop users get longer life

BY CHARLES VON SIMSON
CW STAFF

BOTHEL, Wash. — Traveling Software, Inc. recently upped the ante in the laptop battery maintenance war. The company's new deep discharge feature will be a welcome relief to any user plagued by his system's blinking red light.

The deep discharge function bypasses the voltage spike that signals the system when a Nicad battery is running out of power. That bypass is necessary because if, for example, a four-hour battery is consistently recharged after one hour of use, the computer "learns" to signal the battery monitor that the battery is near depletion after just one hour, making gauges of remaining power useless.

The new software overrides that process and, as the battery weakens, sheds certain power loads to pieces of the system, such as modems or disk drives, until it is simply maintaining the power required to run the CPU. At this point, it signals the system's low battery monitor.

"The laptop catch-22 is that the system will shut itself down, making it impossible to completely drain the battery," said Mark Eppley, president of Traveling Software. "The deep discharge function will eliminate the need to either get a new battery all the time or hire a technician to drain the old one."

Traveling Software is the leader in battery monitoring software, supplying systems for 40 laptop vendors including NEC Corp., Toshiba America, Inc., Dell Computer Corp. and Sharp Electronics Corp.

Digital Research, Inc. (DRI), a Mountain View, Calif.-based supplier of DR-DOS, a clone of Microsoft Corp.'s DOS operating system, also announced recently that it would bundle battery-monitor and power-saving software with its version of DOS. DRI's Battery Max software does not have the deep discharge feature.

Both firms market systems that sense active keystrokes and reduce power to the CPU if the system is not active. This type of software can improve battery life by up to 50% on certain machines. DRI only sells its Battery Max feature bundled in its DR-DOS product. DR-DOS is available either direct from the company or bundled with some clone laptops. Traveling Software's Battery Watch is available from dealers for $49.95.

You Can't Tell

THE NEWSWEEKLY OF INFORMATION SYSTEMS MANAGEMENT
May 7, 1990 · Vol. XXIV · No. 19 · 122 Pages · $2/ Copy · $48/ Year

COMPUTERWORLD

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PRODUCT SPOTLIGHT

BUYERS' SCORECARD

Global rings up lead in ledger rati

BY MICHAEL L. SULLIVAN-TRAINOR

Pitted against the titans of accounting software, Global Software, Inc., a $23-million enterprise, differentiates itself by stubbornly sticking to its knitting.

In the face of Computer Associates International, Inc.'s (CA) acquisition binges and the merger of Management Science America, Inc. (MSA) and McCormack & Dodge (M&D) — both now part of Dun & Bradstreet Software — Global continues to maintain a strong mainframe general-ledger user base (10% of the market) by paying attention to such details as customer support.

Of the four top mainframe general-ledger packages rated by the 280 users surveyed, Global's offering received the highest overall score. The respondents rated only the software they are currently using, with a minimum of 70 users rating each package. Total scores for each package were based on a weighted combination of the numerical ratings of all 21 criteria (see methodology next page).

Global ranked highest in the nuts-and-bolts areas of accounting applications: availability and crash recovery, ease of use and service and support. Users say that the company's support service for installation, called Software Walkthrough, provides above-average assistance in getting the package up and running.

"A lot of vendors will run a sample of someone else's data and say, 'This is what your system will look like,' " says Bob Bulliard, program supervisor at Lafayette General Medical Center. "Global took our data to their Raleigh, N.C., site and ran it for us so we could iron out the requirements."

M&D's general-ledger package received the second highest overall user rating, scoring 41 points to Global's 43. However, users gave M&D's package a slight edge over Global in meeting current business needs — the criterion most important to users. The package was rated significantly higher overall in new technology areas, such as the relational database interface.

MSA's general-ledger package rated one point behind that of its merger partner in the overall score and scored higher than the other packages in custom report generation, effective training and integrating with other modules.

CA's general-ledger product, which came up four points short of the highest score, topped the field in terms of the portability of its programming language and scored strong second-place ratings in overall performance and pricing.

Respondents rated the basic functions of the products as more important than the hot technology areas. They gave the vendors superior marks overall in meeting primary requirements. However, lower ratings were assigned to new areas such as expert systems, networking and adapting to distributed technologies.

Sullivan-Trainor is a *Computerworld* senior editor, features.

COMPUTERWORLD BUYERS' SCORECARD

A summary of the h
ratings shows the mos
effective aspects of each

Product: General Ledger	Score	Strengths Top three ratings:
Global Software's GL (Response base for all products: 70)	43	First-place finishes: 9 Availability & recovery Ease of use Service and support
McCormack & Dodge's GL	41	First-place finishes: 6 Meeting current business needs Range of functions Integrating with other applications
MSA's GL	40	First-place finishes: 5 Custom report generation Effective training Integrating with other modules
Computer Associates' GL	39	First-place finishes: 1 Portability of programming language Overall performance Installation and maintenance pric

tors designed for Apple Computer, Inc. Macintosh systems.

Version 3.1.2 is part of a family that includes the Mac220, Mac240 and Mac241. The product includes a Telnet interface and requires that Apple's Mactcp be installed on the Macintosh system.

The product also offers support for Apple's Communication tool box, 1K byte X modem transfers and Y modem batch transfers.

Version 3.1.2 is available for an upgrade fee of $50.

White Pine Software
P. O. Box 1108
94 Route 101A
Amherst, N.H. 03031
(603) 886-9050

Development tools

Microport, Inc. has announced Formula One System/4, a software package that consists of a complete binary distribution of AT&T's Unix System V, Release 4.

The product serves as an environment for developers who need AT&T certification and who work on networked application and development platforms such as Ethernet networks, according to the vendor.

Formula One System/4 is available to qualified software and hardware developers for $2,500 per copy. A free upgrade for the first commercial release of the product, which is scheduled for November, is included with the current price.

Microport
30 Janis Way
Scotts Valley, Calif. 95066
(408) 438-8649

Cadre Technologies, Inc. has introduced a line of software analysis tools designed for developers working on 8-, 16- and 32-bit microprocessors.

The products include the SFA1000 ($10,500) for performance analysis, the SAW2000 ($15,850) for software debugging and performance analysis on 8- and 16-bit machines and the SAW3000 ($19,500) for 32-bit devices.

The company has also announced Taskview, an Ada debugging, analysis and integration tool that enables developers to analyze performance at the system state and task levels and display dynamic run-time data. Taskview costs $4,500.

Cadre
P.O. Box 1309
Beaverton, Ore. 97075
(800) 547-4445

Data storage

A DOS-based backup product designed for corporate and professional users has been announced by Peter Norton Computing, Inc.

The Norton Backup includes an automated backup interface and a Master Catalog feature, which permits multiple versions of backed-up files to be selected and restored. A Backup Cycle control feature enables users to automatically switch between full and partial backup at predefined frequencies.

The product runs on any IBM Personal Computer, XT, AT, Personal System/2 or compatible with DOS 3.1 or higher versions.

It is priced at $149.

Peter Norton Computing
9th Floor
100 Wilshire Blvd.
Santa Monica, Calif. 90401
(213) 319-2000

Zenith unveils last of its 286s

BY MICHAEL FITZGERALD
CW STAFF

MOUNT PROSPECT, Ill. — Zenith Data Systems last week unwrapped the last Intel Corp. 80286-based desktop machine it will ever make. But this one, the Z-286 LP Plus, rolled out with a twist — a pop-in, pop-out daughterboard said to ease and enhance upgradability.

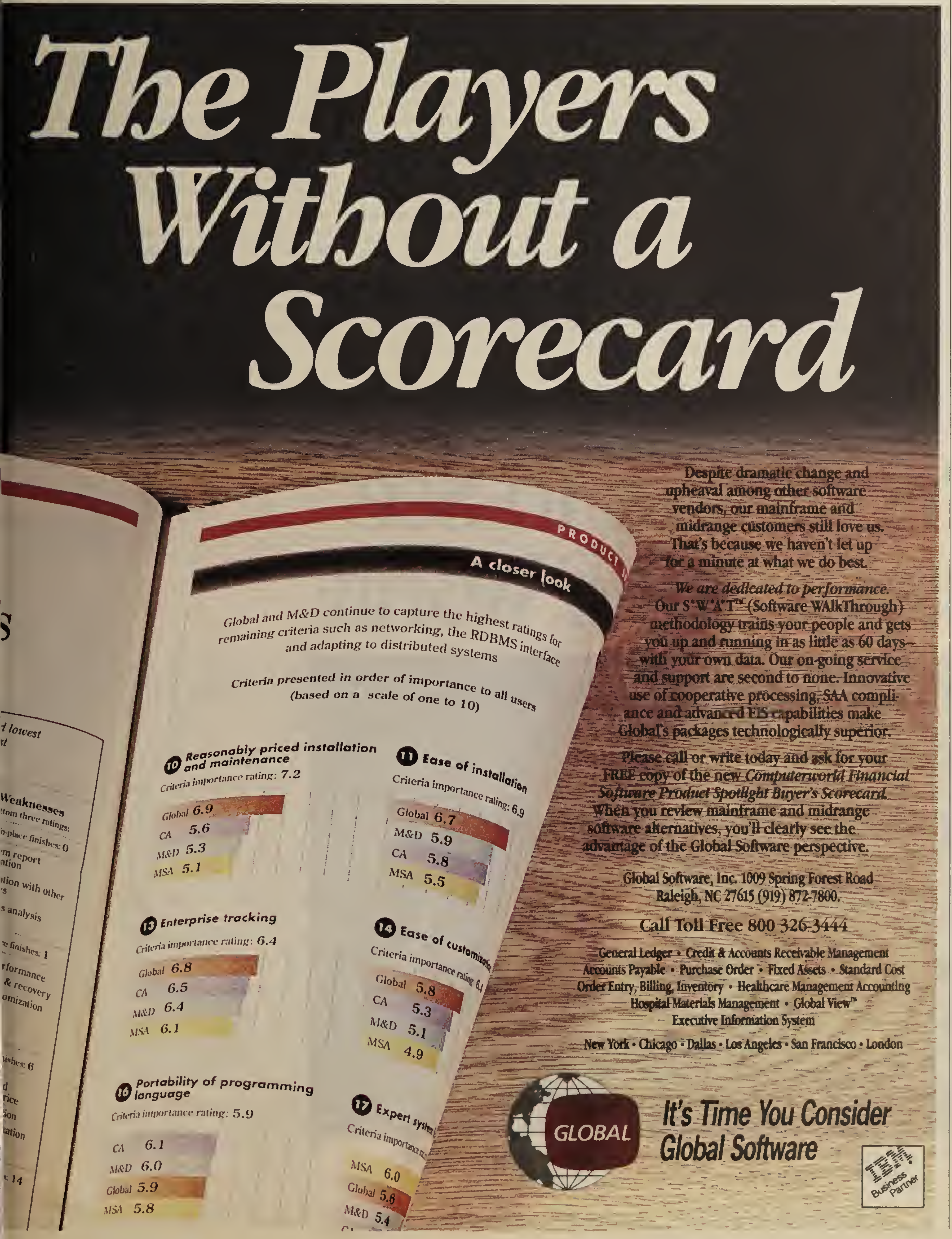
"In the short term, this is our last 286-based machine for the desktop," a Zenith spokesman said. "We may find some esoteric market that will lead us to make [other 286 systems], but at the moment, we expect that it's our last one."

Unlike previous Zenith models, this 286-based personal computer can be easily upgraded to an Intel 80386SX chip.

Citing statistics showing that some seven million 286-based machines will be sold worldwide in 1990, LP Plus product manager Rusty Graham said: "While today the 286 is a pretty viable market, we expect that in about two years the SX will become the mainstream type of computer."

Previous Zenith computers have featured the processor and the coprocessor soldered onto a system board. The LP Plus has installed these same components onto a small daughterboard that can be popped on and off the main system board. A plug-in upgrade can reportedly be completed in less than five minutes. Graham claimed the LP Plus upgrade option "will give customers an easy transition."

The LP Plus comes with IBM's Video Graphics Array video, 1M byte of random-access memory, three expansion slots and a 1.44M-byte 3½-in. disk drive. It is also available configured with either a 20M-byte or 40M-byte hard drive. It runs at 12 MHz, compared with the 16-MHz upgrade. Pricing of the new machine ranges from $1,999 to $2,699. The upgrade card retails for $599.


The Players Without a Scorecard
PRODUCT S
A closer look
Global and M&D continue to capture the highest ratings for remaining criteria such as networking, the RDBMS interface and adapting to distributed systems
Criteria presented in order of importance to all users (based on a scale of one to 10)
10 Reasonably priced installation and maintenance
Criteria importance rating: 7.2
Global 6.9
CA 5.6
M&D 5.3
MSA 5.1
11 Ease of installation
Criteria importance rating: 6.9
Global 6.7
M&D 5.9
CA 5.8
MSA 5.5
13 Enterprise tracking
Criteria importance rating: 6.4
Global 6.8
CA 6.5
M&D 6.4
MSA 6.1
14 Ease of customization
Criteria importance rating: 6.
Global 5.8
CA 5.3
M&D 5.1
MSA 4.9
16 Portability of programming language
Criteria importance rating: 5.9
CA 6.1
M&D 6.0
Global 5.9
MSA 5.8
17 Expert syste
Criteria importance
MSA 6.0
Global 5.6
M&D 5.4
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It's Time You Consider Global Software

Telecommuting

CONTINUED FROM PAGE 43

not always as cut-and-dried as they are in the corporate office.

Working from home can translate into additional expense and inconvenience to those who telecommute. "I love doing this," says Colleen Clark, an engineer at US West in Denver, who has been telecommuting for nearly five years, "but you do have to make a few concessions." Concessions can include a long wait for new equipment, slow access to the office systems and expenses such as buying and repairing personal computers.

The amount of money an organization is able to spend on telecommuting can have a lot to do with how much systems support a user will get, observers say.

> "IT'S SO EXPENSIVE to set someone up at home with everything they have in the office that we haven't been able to do that for anyone yet."
>
> JOHN GABRIEL
> WASHINGTON STATE ENERGY OFFICE

Support at Levi Strauss

Levi Strauss & Co. in San Francisco is running a pilot telecommuting program in its information resources group, where about 30 people have been telecommuting since January. The company installed separate phone lines for voice and data for each telecommuter as well as a PC and a facsimile machine. It also provides call forwarding off its private branch exchange and has a contract with TRW, Inc. for support of PCs and peripherals that extends to the home offices.

The company says there is an eight-hour turnaround time for repairs to equipment at home offices.

The objective was not to cut cost, according to Gevenie Delsol, director of business communications at Levi Strauss. "We're just trying to provide a better business climate. The aim was to duplicate an office environment as closely as possible."

The Washington State Energy Office in Olympia, Wash., has also instituted a pilot telecommuting program as part of a two-year state telecommuting project it is coordinating. The in-house program involves about 30 people. But unlike Levi Strauss, would-be participants who need a PC have to buy it themselves. Loaners are available but are limited in number and given out on a lottery basis. The loaner equipment consisted of four Hewlett-Packard Co. Vectra 286/12 machines that were available for a year in conjunction with the state project.

A few Zenith Data Systems and Toshiba America, Inc. office laptops that had been used by employees attending conferences are also available to be checked out on an as-needed basis when not needed by conference attendees.

"It's so expensive to set someone up at home with everything they have in the office that we haven't been able to do that for anyone yet," says John Gabriel, coordinator of the Energy Office's program. "As a state agency, it's particularly hard for us to justify the expense."

Marilyn VanArkel is one of the telecommuters who made the decision to buy a PC. "Almost all of my work is done on my computer. I figure it was an investment, and I might as well have the equipment I need," she says.

State support

Gabriel's office will provide support for the four Vectras, although users will have to bring them into the central office for service. Telecommuters who own their own equipment are responsible for paying for their repairs.

Because the agency is providing word processing and spreadsheet software to the telecommuters, it will care for anything that goes wrong with the software.

Requiring employees to buy their own PCs creates a financial barrier for some would-be telecommuters, says Gil Gordon, president of Gil Gordon Associates, a Monmouth, N.J.-based consultancy specializing in telecommuting issues. "If the budget is tight," he advises, "why doesn't [a firm] . . . buy a limited number of laptops and lend them out?"

A loaner program can go a long way when setting up a telecommuting program on a limited budget, he adds.

'Mixed bag'

At the California Department of General Services, which is completing a two-year telecommuting pilot program involving approximately 150 people from several different state agencies, who pays for what is a matter of agency discretion.

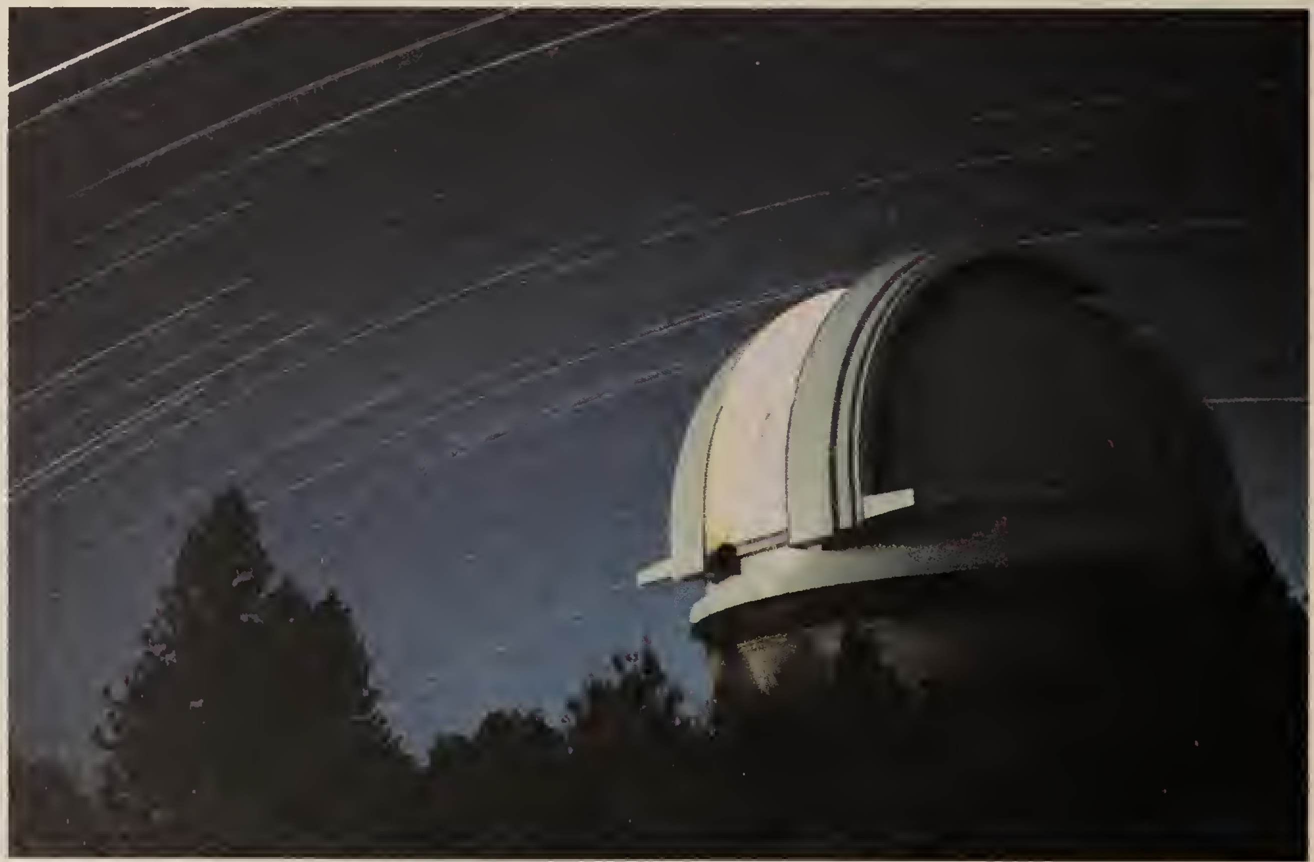
"It's a mixed bag," says David Fleming, telecommuting program manager. "We had some agencies that said, 'If your telecommuting tasks require a PC, then it will be up to you to provide your own computer.' Others said they would provide a computer if you telecommute three or more days a week."

As with Washington's State Energy office, the PC owner is the one who takes care of maintenance and repairs.

Fleming, who telecommutes using a computer owned by the state, says that if he has a problem, he can contact his office to send an in-house staffer to his home or he can swap out the PC on one of the days that he goes into work.

Al Jacobus at the telecommunications division of the Department of General Services also telecommutes four days per week. While he is entitled to bring his state-owned PC home, he prefers the computer he already has. Thus, maintenance and repair are up to him.

The Power to See Outside Your World.

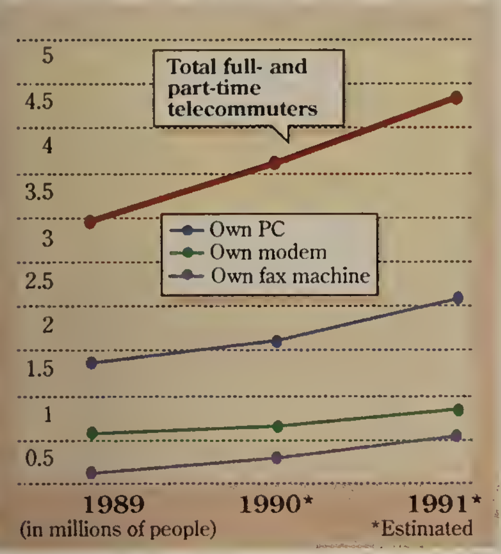


With its 200-inch telescope, one of the largest in the world, Mount Palomar Observatory can focus on stars not visible to the naked eye.

Many companies' telecommuting programs evolve out of more casual arrangements, in which full-time staffers start out by doing extra work on their home PCs and end up working from their homes on a more formal basis. This evolution can blur the lines of support between users and the company.

Home away from business

The number of telecommuters importing equipment into the home is on the rise



Source: Link Resources CW Chart: Paul Mock

Such is the case at Farallon Computing, Inc. in Emeryville, Calif. "Our program is not formal. It definitely just evolved," says Mark Vinsel, Farallon's network manager. Most of Farallon's telecommuters already had machines at home, so the firm provided them with 9.6K bit/sec. modems to tie them into the company's network.

Support is a matter of geography. "If they are a long way away, they have to get local service. But if they are close by, they can bring it in, and I'll swap it," Vinsel says. Farallon picks up the support cost. "[For] Farallon employees using our equipment, we would pay to fix it," Vinsel says.

As more people get involved in a telecommuting program, support issues are likely to crop up more regularly, consultants say.

At the Department of General Services, the level of support for state-owned machines can depend on the employee's computer knowledge. Jacobus installed his equipment himself, "but for people who are not computer literate, [office support staff] will go out, set up the computer, load all the software and get the person going." Installation of state-owned equipment is free.

Western policy

At US West, employees usually install their own equipment, which is provided by the company, says Mike Dillon, who oversees the firm's telecommuting policy. "We don't really have a support group that goes out to the homes to set them up," he says, "but the vast majority of the commuters at US West are in the data computing field and are probably very familiar with the equipment they're dealing with."

That doesn't extend to repairing the equipment, however. US West has telecommuting programs set up at several divisions. Where there is an internal PC repair group at the division, employees can bring in their machines for repair at the company, or a staff member will make a house call. Dillon says that telecommuters at divisions without such staffing can take any repair problems to the local provider previously agreed on by the company. US West bears the cost of the repairs in each case.

Home ties

Another stumbling block for telecommuters can be the ease — or lack thereof — with which they are able to gain access to the corporate office.

To avoid this problem, Levi Strauss chose to install 9.6K bit/sec. modems for its telecommuters. The 2,400 bit/sec. modem "would have made it too obvious that you were working at home," Delsol says. "It would have made it hard for some of the programmers who are on the mainframe a lot."

US West's Clark says her home modem is a 2,400K bit/sec. model, "but in the office we're on 9.6K, so there's a big difference," she says.

Even with the high-speed modems, Levis Strauss did run into trouble with transmission quality. To fix the problem, it worked with Pacific Bell to install data-quality lines, which reduce data errors and the number of retransmissions necessary on the line.

For Washington's Energy Office, the problem with access turned out to be with its packaged communications software, which was "very complex and not really user-friendly," Gabriel says. So the company is developing software in-house that should take care of telecommuters' needs in a much simpler manner. Gabriel says that most of the telecommuters only need to use electronic mail or send and retrieve files and do not need sophisticated communications software.

> "OUR PROGRAM is not formal. It definitely just evolved."
>
> MARK VINSEL
> FARALLON

Gabriel says the software development effort was born when his director nearly lost several weeks' worth of work because of a transmission glitch. "He said, 'That's it. If we can't buy it, we'll create it.' "

In spite of the drawbacks, most telecommuters say they enjoy their situation. According to General Services' Fleming, the key to telecommuting is accepting some give and take.

"The idea with this is not to standardize everything down to the nth degree. Let it work for you, be flexible."

VanArkel finds telecommuting worth the effort, too. "I really like telecommuting," she says. "I find that there are things to be worked out, but they're certainly worth the effort."

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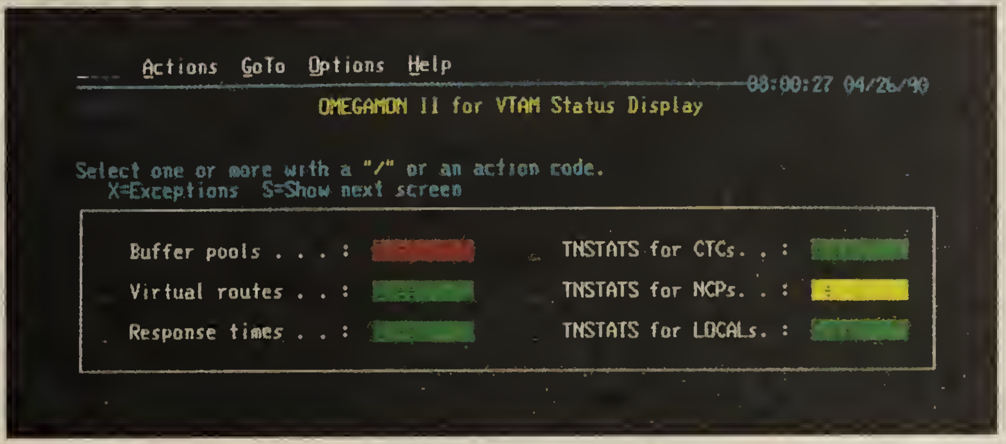

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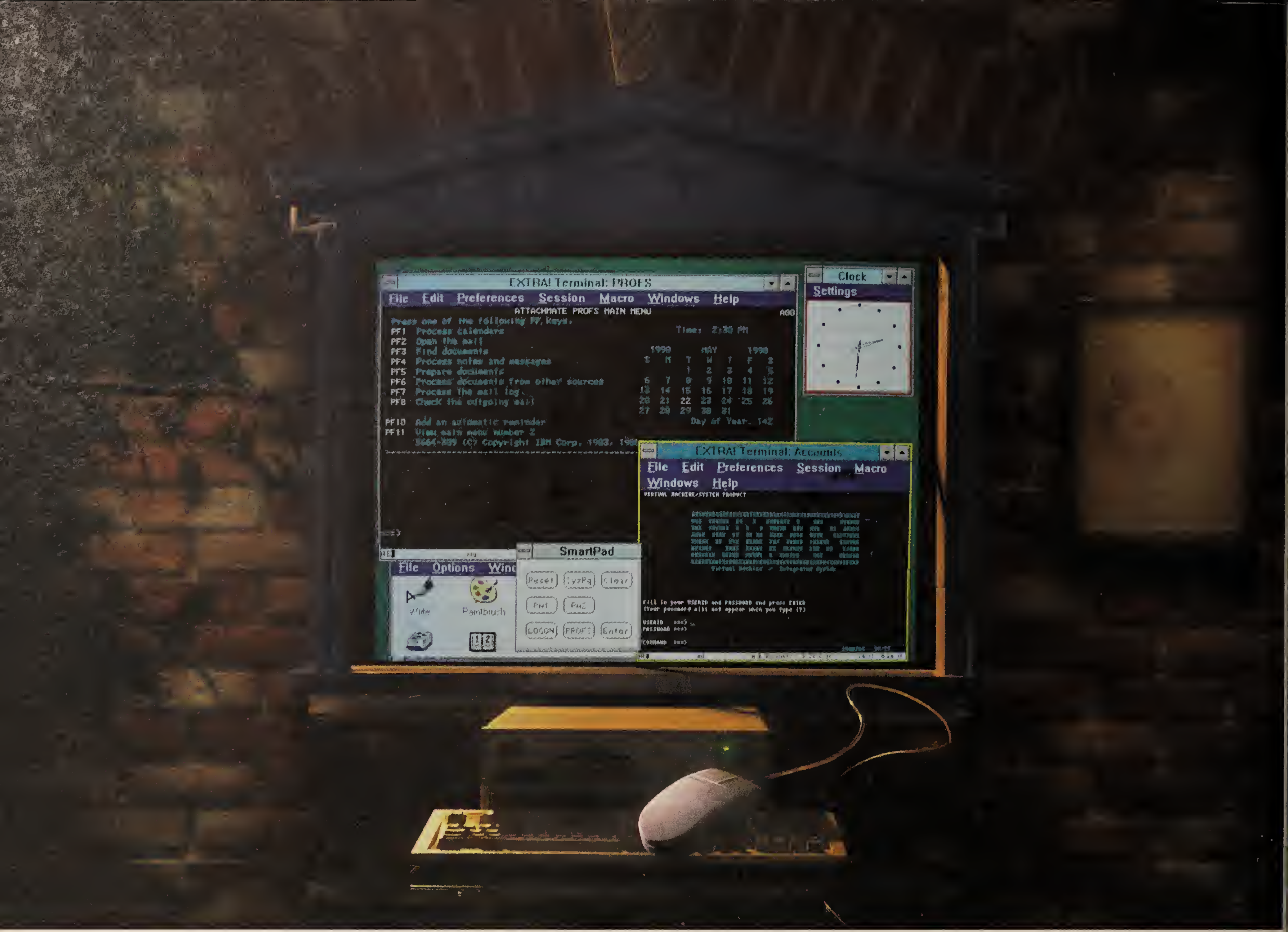

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PF2  Open the mail
PF3  Find documents                            1990      MAY      1990
PF4  Process notes and messages                S    M    T    W    T    F    S
PF5  Prepare documents                                   1    2    3    4    5
PF6  Process documents from other sources      6    7    8    9    10   11   12
PF7  Process the mail log                      13   14   15   16   17   18   19
PF8  Check the outgoing mail                   20   21   22   23   24   25   26
                                               27   28   29   30   31
PF10 Add an automatic reminder                           Day of Year  142
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NETWORKING

COMMENTARY

Ellis Booker

EDI in demand

Taking matters into their own hands, top retailers, car makers and insurance companies are telling their trading partners with increasing intensity to ramp up their electronic data interchange (EDI) capabilities.

With varying degrees of stridency, all have told their trading partners that EDI is a good thing, that standardized electronic interfaces promise to improve efficiency by cutting out the administrative overhead required to process paper forms. Electronic messaging, they add, reduces errors, speeds up turnaround times and (in the case of retailers) could reduce the size of inventories in stores.

But there is another reason for the drive to EDI. I suspect that all big, progressive companies, known in EDI parlance as "hubs," realize that the old modes of doing business with consumers are going to change.

Already, savvy (i.e., computer-literate) consumers can access an on-line information network — say, the Prodigy service from IBM and Sears, Roebuck and Co. — and order a dizzying array of goods. All you need is a credit card.

What happens to these high-tech orders on the receiving end, however, is anybody's guess. For example, apparently a number of companies, not all of them small, take incoming EDI orders from their customers, print them out and then traffic

Continued on page 58

The little protocol that could

For three years, EDI has been chugging its way into the railroad industry

BY JIM NASH
CW STAFF

It was poet lariat Will Rogers who said: "Even if you're on the right track, you'll get run over if you just sit there."

Heeding those words two generations later, the railroad industry embraced electronic data interchange (EDI). In 1987, most major rail companies had dial-up services that customers could use to trace the location of their equipment as it was hauled across the country.

There was a hitch, though. Goods transported by rail are often pulled by several rail companies, each with its own tracing software. The only way to locate equipment was to dial up each railroad company with the appropriate micro-to-mainframe software. Customers were left with the time-consuming task of contacting several firms each day.

Susan Souerbry, office manager at Delta Tank Line Co. in Longview, Texas, said it took her 45 minutes each morning to call up each rail company to keep tabs on Delta tank cars.

"Shippers were saying, 'I just want to key in quickly and find out where my equipment is,' " said Judy Martin, manager of customer support at Burlington Northern Railroad. "I don't think we knew we did it so differently," Martin said of the railroad tracking systems.

Three years ago this month, 14 major North American rail companies gathered as a task force to discuss ways of hurdling protocol barricades for customers. Martin was sent to represent Burlington Northern.

She said defining specifications for software opened the association's eyes. "It helped us appreciate the frustration the customers were experiencing," she said. There seemed no way to reconcile the protocol differences in the industry.

The task force detailed these differences, along with what a generic tracing software package should hold for customers. It then handed the specs over to the Association of American Railroads (AAR), which would find a software developer.

This was where the plan derailed. Specs were drawn up, but in 1988, the AAR's legal staff balked, saying the association risked an antitrust suit if rail companies bought the software from only one vendor, Martin explained. Virtually all activity on the matter stopped, she said. Navigating the protocol problem seemed too daunting for many railroad executives to deal with individually, according to Martin, including some at Fort Worth, Texas-based Burlington Northern.

Many looked at their bottom lines and figured the matter was best left for dead, Martin said.

The prevailing argument at Burlington Northern, however, was that too much time and money had been put into it to abandon the project. Executives bet that a feasible protocol solution could be found and that the company might gain a goodwill bene-

Continued on page 60

Network's network links CBS coast to coast

ON SITE

BY JIM NASH
CW STAFF

Linking anchorman Dan Rather with *The Young and the Restless* means more than sending the newsman to cover spring break in Palm Springs, Calif.

CBS has finished upgrading its coast-to-coast computer network with Newbridge Networks Corp. 3600-series T1 multiplexers. Last week, it completed the process of tying together its corporate offices — including the New York studio used for Rather's broadcasts and the Los Angeles studios used to tape two soap operas.

The television network is now moving on T1 connections between CBS' largest TV stations. Beyond that, said Tom Maile, vice-president of telecommunications at CBS, lies the possibility of connections to European broadcast companies.

Maile said the Newbridge multiplexers are replacing the network's aging Amdahl Corp. point-to-point multiplexers for transmitting data. Long-term plans call for including voice and facsimile transmissions. He declined to say how much the new system cost or when its payback is expected.

Herndon, Va.-based Newbridge has installed Mainstreet T1 Bandwidth Managers in CBS' New York broadcast center and headquarters, its Secaucus, N.J., data center and its Los Angeles studios and broadcast center as well as its Washington, D.C., news bureau. Two 4602 Mainstreet Networkstations, one each in New York and New Jersey, are managing the system.

The second phase begins in January 1991, connecting TV stations in Chicago, Philadelphia, Miami and St. Louis, four of CBS' largest owned and operated stations. Spare bandwidth on the network's broadcast signal will send information to CBS affiliates, Maile said.

While there are no plans to tie into Canadian stations, Maile said, network executives are looking at possible links to European broadcast companies. CBS has won contracts to televise the 1992 and '94 Olympics in France and Norway, respectively — which, Maile said, highlighted one of Newbridge's strong points.

He said that although competitive pricing was a primary concern in awarding the contract to Newbridge over Network Equipment Technologies, Inc., Timeplex, Inc. and other multiplexer firms, standardization was also key.

"Newbridge is not proprietary," Maile said. "It has T1, fractional T1, and other features based on [CCITT] standards." Mainstreet, for example, is already configured for the European counterpart to T1, he said. What's more, the equipment accommodates U.S. and European power supplies.

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Telecom users root against underdogs

As power of AT&T slips, users call for controls on increasingly powerful Sprint, MCI

ANALYSIS

BY GARY H. ANTHES
CW STAFF

Some of the nation's largest telecommunications users are applauding proposals to loosen regulatory reins on AT&T while simultaneously calling for tighter controls over MCI Communications Corp. and US Sprint Communications Co., the No. 2 and No. 3 players in the $50 billion long-distance marketplace.

In comments filed recently with the Federal Communications Commission (FCC), some consumers of telecom services called for greater public disclosure to MCI and Sprint contract prices, while others suggested that some of the rules that have constrained the former Ma Bell since its 1984 divestiture might reasonably be applied to its increasingly powerful competitors.

Since the breakup of AT&T six years ago, the telecommunications giant has seen a steady erosion of its market share, particularly at the high end of the services market. Meanwhile, the financial and technological prowess of its competitors has grown dramatically.

Heightened competition

In response, the FCC recently concluded that competition in long-distance voice and data services had increased to the point that many of the regulatory constraints on AT&T could be phased out. In addition, the commission found the high-end business services market to be especially competitive.

Users generally supported gradual relaxation of controls on business services, saying that deregulation stimulates competition and leads to lower prices and better service.

"The FCC is striking the right balance and proceeding at about the right pace," said John Lynn, telecommunications counsel at Electronic Data Systems Corp.

However, some users who are enjoying the benefits of lower prices and more choices said that they see a dark lining in the silver cloud of divestiture.

As the market shares of MCI and Sprint increase, so does the possibility that they could engage in the unfair practices long attributed to AT&T, the users said.

A group of the nation's largest financial institutions has banded together to call for reduced regulation for AT&T as well as a simultaneous boost in scrutiny — if not in controls — of AT&T's competitors.

Henry D. Levine, a Washington, D.C.-based attorney for the group, said he would require all long-distance carriers to file tariffs — public notices of prices and services — for customer-specific services, typically the custom deals made for voice and data networks for large customers.

That would put AT&T on an equal footing with MCI and Sprint, but not the footing suggested by the FCC.

One FCC proposal would permit AT&T to negotiate private contract rates rather than submitting to a lengthy process of price disclosure and justification. Levine's proposal would accomplish the same streamlining but would open all prices to public scrutiny.

Levine said he is not proposing to regulate AT&T's competitors. He would simply impose a notification requirement that makes comparison shopping for network services easier.

In its request for public comments in March, the FCC asked whether it should relax controls on AT&T's provision of enhanced services, such as electronic mail and credit-card authorization, as well as whether it should ease its rules against the bundling of services and equipment.

Adapso, a computer software and services trade association, strongly urged the FCC to leave in place the safeguards intended to protect other providers of enhanced services that use AT&T circuits, many of whom are Adapso members.

Follow the leader

Adapso called AT&T, MCI and Sprint an oligopoly in which AT&T erects umbrella prices to which the junior members peg their rates. Adapso also alluded to a "behavioral umbrella" that influences the practices of MCI and Sprint.

The trade association's FCC filing said, "Adapso is very concerned that if the commission were to relieve AT&T of its . . . obligations and AT&T were to discriminate against its enhanced services competitors, MCI and Sprint are just as likely as not to respond by following suit."

Adapso said that the FCC should not relieve AT&T of its controls but should consider requiring the same or similar safeguards of MCI and Sprint.

Charles Helein, general counsel for America's Carriers Telecommunications Association, said, "When AT&T burps, [other carriers] adjust prices accordingly. MCI and Sprint have always dovetailed with AT&T."

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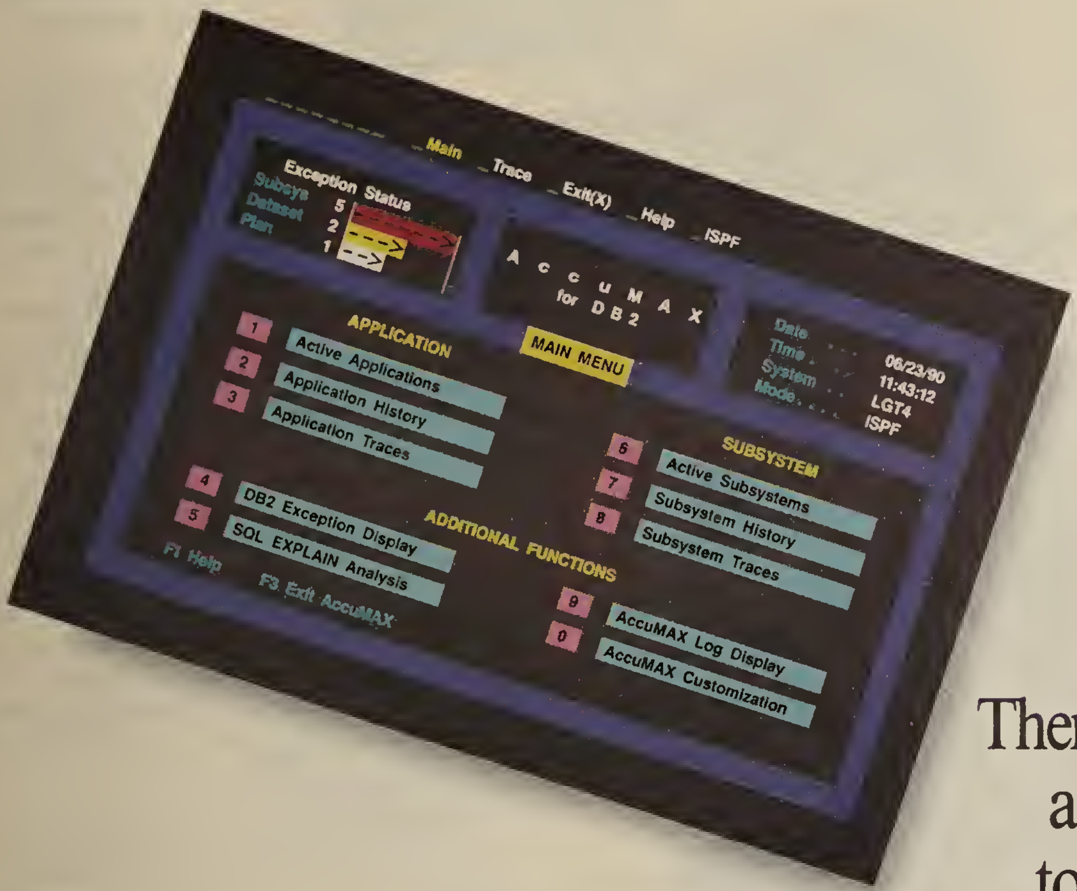

```
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Exception Status
Subsys   5 ------->
Dataset  2 --->
Plan     1 -->
A c c u M A X
for D B 2
MAIN MENU
Date . . .   06/23/90
Time . . .   11:43:12
System . .   LGT4
Mode . . .   ISPF
APPLICATION
1 Active Applications
2 Application History
3 Application Traces
SUBSYSTEM
6 Active Subsystems
7 Subsystem History
8 Subsystem Traces
ADDITIONAL FUNCTIONS
4 DB2 Exception Display
5 SQL EXPLAIN Analysis
9 AccuMAX Log Display
0 AccuMAX Customization
F1 Help     F3 Exit AccuMAX
```

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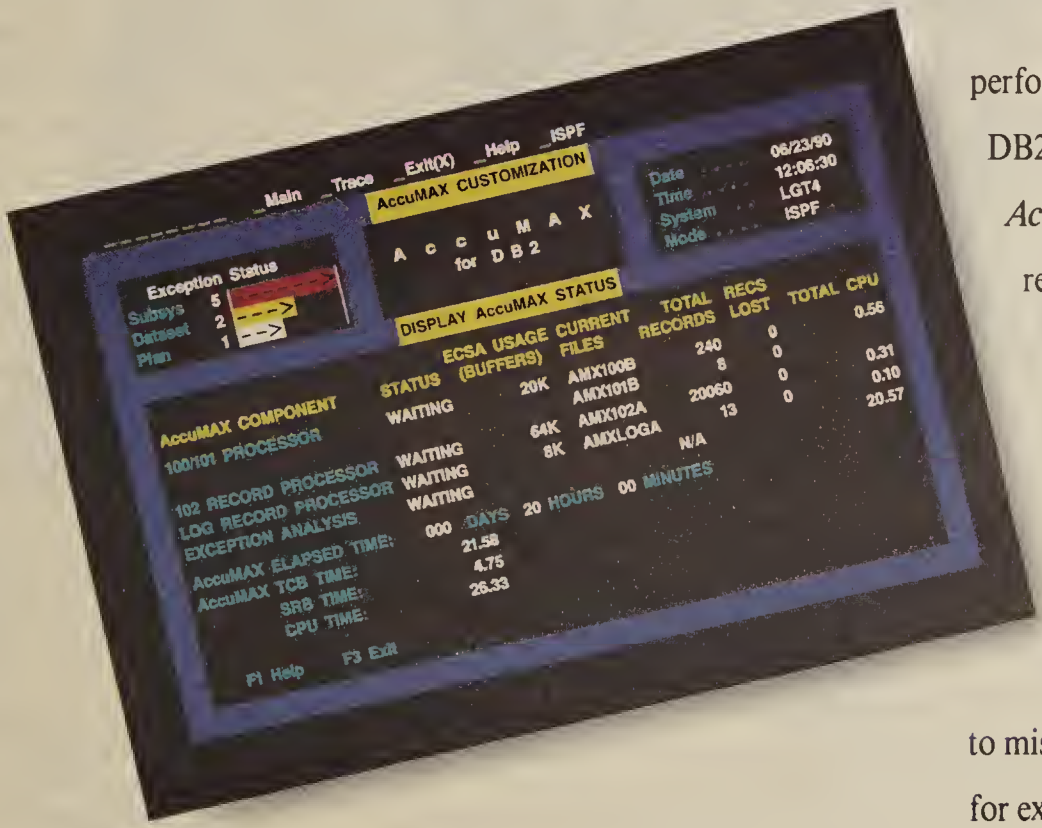

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AccuMAX CUSTOMIZATION
Exception Status
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Dataset  2 --->
Plan     1 -->
A c c u M A X
for D B 2
Date . . .   06/23/90
Time . . .   12:06:30
System . .   LGT4
Mode . . .   ISPF
DISPLAY AccuMAX STATUS
                                  ECSA USAGE  CURRENT   TOTAL    RECS
AccuMAX COMPONENT        STATUS   (BUFFERS)   FILES     RECORDS  LOST   TOTAL CPU
100/101 PROCESSOR        WAITING     20K      AMX100B     240     0       0.56
                                              AMX101B       8     0       0.31
102 RECORD PROCESSOR     WAITING     64K      AMX102A   20060     0       0.10
LOG RECORD PROCESSOR     WAITING      8K      AMXLOGA      13     0      20.57
EXCEPTION ANALYSIS       WAITING                          N/A
AccuMAX ELAPSED TIME:    000 DAYS  20 HOURS  00 MINUTES
AccuMAX TCB TIME:          21.58
        SRB TIME:           4.75
        CPU TIME:          26.33
F1 Help     F3 Exit
```

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LEGENT

Finding foreign fingers in standards pie

BY ELISABETH HORWITT
CW STAFF

LUXEMBOURG — The European Community is moving to simplify conformance testing of networking products for its member nations, but U.S. equipment vendors are concerned about losing control of the conformance certification process to a government body.

A recent meeting of Council of Telecommunications ministers achieved consensus on a proposed directive that would give equipment vendors the right to sell to all 12 Common Market nations if their products pass conformance tests administered by just one of those countries. Currently, each country administers its own tests to ensure that equipment complies with protocols for interfacing with its own public networks. The proposal is now set for approval at a future council meeting.

While applauding the commission's overall goals of "harmonizing standards" and providing "uniformity of testing," the Computer and Business Equipment Manufacturers Association (CBEMA) said it opposes making standards conformance testing "a government-run process."

"There is a trend now in Europe to use voluntary standards as the basis for procurement regulations and requirements, and that could amount to a nontariff trade barrier so easily," CBEMA spokeswoman Mary Ann Karinch said.

However, Frank Dzubeck, president of Washington, D.C.-based consulting firm Communications Network Architects, Inc., said he believes that by "providing one point of testing for selling to European markets," the directive would finally open up overseas countries to smaller vendors that cannot afford a country-by-country testing process.

In particular, the local-area network and bridge markets should experience "hellacious growth" in Europe, as vendors such as 3Com Corp., Wellfleet Communications, Inc. and Cisco Systems, Inc. take advantage of the lower cost entry barriers, he added.

The "one-stop conformity checks" proposed by the directive would "mark a significant step toward the single European market" and make "a variety of telecom terminals more widely, cheaply and rapidly available to users," the commission said.

The directive can only work effectively, however, if the commission achieves a related goal of widespread support of telecommunications standards — such as Integrated Services Digital Network — throughout the European Community.

Setting up European administrations as standards certification authorities also poses a number of logistical questions, Karinch added, such as the number of test facilities there would be. Furthermore, if a certification backlog developed, the question would arise as to which gets tested first — European or non-European vendors.

"Obviously, a product has to be approved for use in the country where we want to use it" so that it will interface with the national network and "be maintainable by the local organization," said John Puckett, manager of technical operations at The Foxboro Co., a Foxboro, Mass.-based international manufacturer. Such approval processes can be difficult and lengthy, Puckett acknowledged, "and in some instances there are long backlogs" at test facilities.

> IF A CERTIFICATION backlog developed, the question would arise as to which gets tested first — European or non-European vendors.

CBEMA advocates uniform testing for conformity, "but we want it to remain in the hands of the manufacturers," Karinch said.

Users benefit if vendors provide their own standards certification, she added, because vendors are then legally liable if a product does not turn out to conform to specifications.

The U.S. networking industry has already shown decreasing dependence on conformance testing by organizations such as the Corporation for Open Systems, said Peter Sevcik, president of Sevcik Consulting. "It has not become as big a deal as people thought it would; people are getting by without it," he said.

However, apparently not all users trust vendors to provide reliable standards compliance on their own. At The Foxboro Co., "we like to do our own conformance testing in a pilot environment before we begin implementing, because we find that what vendors publish about conformance testing and specifications is not always true," Puckett said.

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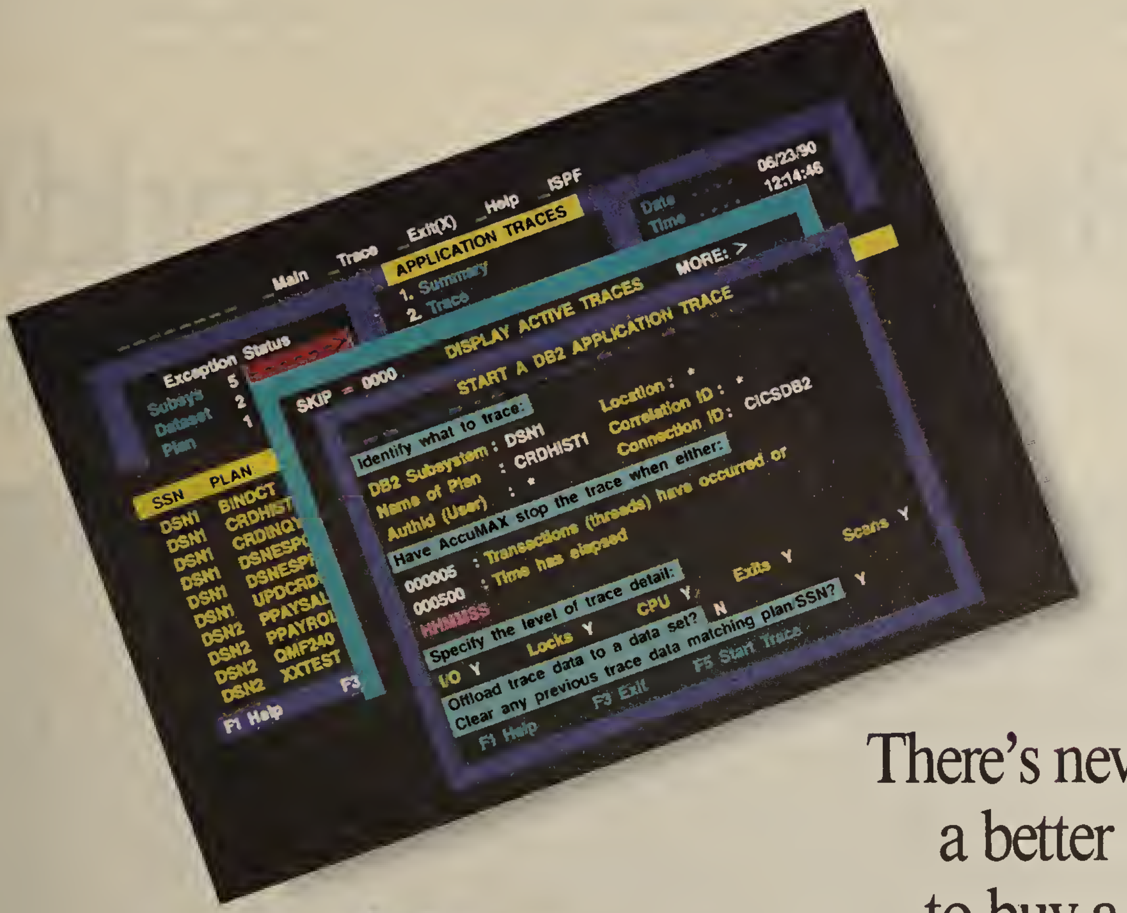

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APPLICATION TRACES
1. Summary
2. Trace
Date . . . .  06/23/90
Time . . . .  12:14:46
Exception Status
Subsys   5
Dataset  2
Plan     1
SSN   PLAN
DSN1  BINOCT
DSN1  CRDHIST
DSN1  CRDINQY
DSN1  DSNESPC
DSN1  DSNESPI
DSN1  UPDCRD
DSN1  PPAYSAL
DSN2  PPAYROL
DSN2  QMF240
DSN2  XXTEST
F1 Help  F3

DISPLAY ACTIVE TRACES
SKIP = 0000                                  MORE: >

START A DB2 APPLICATION TRACE
Identify what to trace:
DB2 Subsystem : DSN1       Location : *
Name of Plan  : CRDHIST1   Correlation ID : *
Authid (User) : *          Connection ID: CICSDB2
Have AccuMAX stop the trace when either:
000005 : Transactions (threads) have occurred or
000500 : Time has elapsed
HHMMSS
Specify the level of trace detail:
I/O Y    Locks Y    CPU Y    Exits Y    Scans Y
Offload trace data to a data set? N
Clear any previous trace data matching plan/SSN? Y
F1 Help          F3 Exit          F5 Start Trace
```

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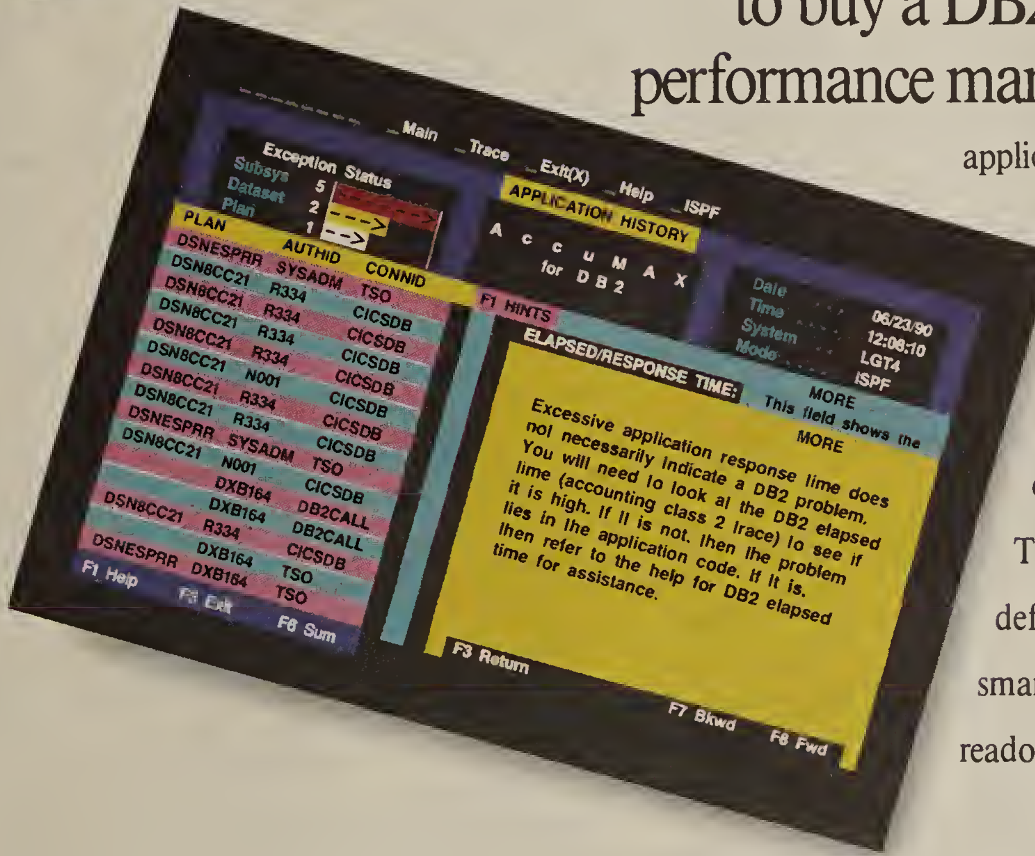

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_Main  _Trace  _Exit(X)  _Help  _ISPF
Exception Status
Subsys   5  ----->
Dataset  2  --->
Plan     1  -->
APPLICATION HISTORY
A c c u M A X
  for D B 2
Date . . . .    06/23/90
Time . . . .    12:08:10
System . . . .  LGT4
Mode . . . .    ISPF
PLAN      AUTHID   CONNID
DSNESPRR  SYSADM   TSO
DSN8CC21  R334     CICSDB
DSN8CC21  R334     CICSDB
DSN8CC21  R334     CICSDB
DSN8CC21  R334     CICSDB
DSN8CC21  N001     CICSDB
DSN8CC21  R334     CICSDB
DSN8CC21  R334     CICSDB
DSNESPRR  SYSADM   TSO
DSN8CC21  N001     CICSDB
          DXB164   DB2CALL
          DXB164   DB2CALL
DSN8CC21  R334     CICSDB
          DXB164   TSO
DSNESPRR  DXB164   TSO
F1 Help   F3 Exit   F6 Sum

F1 HINTS
ELAPSED/RESPONSE TIME:               MORE
This field shows the
                                     MORE
Excessive application response time does
not necessarily indicate a DB2 problem.
You will need to look at the DB2 elapsed
time (accounting class 2 trace) to see if
it is high. If it is not, then the problem
lies in the application code. If it is,
then refer to the help for DB2 elapsed
time for assistance.
F3 Return                F7 Bkwd    F8 Fwd
```

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LEGENT

VSAT industry seeks a few new niches

BY JOANIE M. WEXLER
CW STAFF

FRAMINGHAM, Mass. — Like the saturated private branch exchange and T1 markets, the very small aperture terminal (VSAT) industry will require resuscitation by new market niches, including smaller businesses and those expanding globally, according to a report from industry research firm International Data Corp. (IDC).

VSAT networks, which allow direct satellite communications, generally consist of one large, central station with any number of remote VSATs. VSATs use small 1- to 2-meter dishes, usually located on rooftops.

IDC estimated the total market for VSAT equipment and services for 1989 at $700 million and predicted it will increase to more than $1 billion in 1991 and to $3.37 billion by 1994.

However, the research firm said the expanding market will grow by decreasing percentages because of lower equipment prices caused by competition and lower sales volume generated by smaller customers. Also, VSAT vendors will increasingly operate hubs that can be shared by their customers, which will decrease service costs.

The report pegged VSAT customers as those with high data transmission requirements that tax the dial-up network; those generating large, random data file transfers that do not require dedicated leased lines; and those requiring point-to-multipoint data transmission.

The IDC report editor and primary researcher, Caroline J. Michel, added that VSATs can come in handy as a backup alternative. "Having one terrestrial route and one in the air is safer for mission-critical applications," she noted. "If both alternate routes are in the ground and travel the same general path, the same earthquake will likely knock out both."

Booker

FROM PAGE 53

these pieces of paper as they would any invoice.

However, the notion of making EDI work from the start of the process to the end is going to happen — and may be happening in limited instances even today.

In theory, it will mean that when a consumer dials up the food specialty department of her favorite store to order a nonstick slotted spoon, this request will be transferred to the store's inventory department. If the item isn't in stock, the message will continue on its journey, first to the supplier, which in turn will message its manufacturing plant in Nebraska. There the message, having traversed miles of territory and many computer systems, will be reformatted by a factory-floor controller that runs a slotted spoon die press.

The hubs want to be ready for this world of end-to-end EDI, so they are selling the concept in the meantime to their trading partners in terms of local, relatively limited benefits. Alas, if the hubs were honest, they'd admit that an EDI interface is only the tip of the iceberg.

If the slotted spoon scenario above is accurate, it means the movement toward EDI will require many more fundamental changes to the way information systems are used inside and across enterprises.

Dave Reberry, vice-president of systems engineering and development at US West Advanced Technologies, the research and development arm of the Denver-based regional holding company, recently talked about getting value from IS this way: "For example, all our billing systems have been built around certain assumptions about how you do business with the customer. Going forward, a lot of these assumptions are no longer going to be valid."

Booker is *Computerworld's* Chicago bureau chief.

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BIT BLAST

IBM to sell Interlink gateways in U.S., Canada

IBM will reportedly sell **Interlink Computer Sciences, Inc.** gateways and other products in the U.S., Canada and Puerto Rico starting Friday.

A test facility for verifying multivendor interoperability of Fiber Distributed Data Interface (FDDI) local-area network tools is up and running at **Advanced Micro Devices, Inc.'s** Sunnyvale, Calif., campus with its reported 18 charter members.

Internetworking company **Vitalink Communications Corp.** has announced that it will add **Digital Equipment Corp.'s** Decnet Phase IV support to Vitalink Transpath bridges and routers.

Under a $3 million contract, **Acer, Inc.** will reportedly incorporate **Proteon, Inc.'s** Pronet-4/16 IBM Token-Ring-compatible network interface cards and its Series 70 Intelligent Wire Center into Acer's Token-Ring Network 5290 series.

Under an agreement with **Powercore, Inc., Vitek Systems Distribution** will distribute Powercore's Network Scheduler II, a multiuser application program for automating projects and meetings across a network.

GTE Telephone Operations has announced plans to provide data communications and office systems services — including systems design and integration — in the company's four operating areas throughout the U.S.

AT&T lowered interstate and international long-distance service rates by more than $300 million July 1. The price cuts were facilitated by a Federal Communications Commission regulation that reduced AT&T and other long-distance carrier fees to local telephone companies for accessing customer telephone lines.

Bell South Corp. reportedly plans to sell **DEC's** voice and data networking products in conjunction with the carrier's private branch exchange (PBX) and/or central office-based products and services.

Ungermann-Bass, Inc. has announced it will resell **Norton-Lambert Corp.'s** Close-Up and Close-Up/LAN remote communications software packages and integrate them into its customer support programs.

IBM has selected **Amnet, Inc.** to develop software for IBM Personal Computers used as nodes in X.25 networks.

Products linking hosts, LANs and videoconferencing and imaging systems to Integrated Services Digital Networks have been announced by **Ascend Communications, Inc.**

Codex Corp. said it will support AT&T's enterprise network manager, Accumaster Integrator, by the end of the year through an interface in the Codex 9800 series Integrated Network Management System.

An FDDI chip that implements all physical-layer functions of the 100M bit/sec. LAN is reportedly being tested by **AT&T Microelectronics**.

Rolm Co. and **Norstan, Inc.** have announced that Norstan will refurbish and resell Rolm PBX equipment in the U.S.

Team One Systems, Inc. has announced that **Sun Microsystems, Inc.'s** Sunnet License — a combination developer's tool kit/Openlook graphical user interface license administration tool — has been integrated into its Teamnet 2.0 Concurrent Product Development Environment.

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BIT BLAST

Compuserve dials up Fujitsu

Compuserve, Inc. has announced an interconnection agreement with **Fujitsu Ltd.** that will give Compuserve's network customers dial-up access at up to 2.4K bit/sec. from nine major Japanese cities next month. Access to additional Japanese cities will be added in future months, Compuserve said. The direct access will be less expensive than Compuserve's current connections to Japan via various gateways, the vendor said.

Infonet and **Andersen Consulting** have entered into a nonexclusive agreement to offer their respective services to each other's clients on a preferred basis. The aim is to combine Andersen Consulting's integration and implementation services with Infonet's global networking services in order to target the outsourcing market more effectively.

Infonet has extended its international packet-switched data, electronic mail, facsimile and telex services to Ireland, with a communications facility in Dublin that is scheduled to become operational next month, Infonet said. Infonet is also interconnecting its services with the Postnet public data network, which is operated by **Postgem** in Ireland.

EDI

CONTINUED FROM PAGE 53

fit from pleased customers, Martin said.

Software developer Rathe, Inc. in Forest Lawn, Minn., was hired by Burlington Northern in April 1989 to write a program based on the task force's specs. Rathe created BN Lynx software, which accommodates the protocols of 12 major carriers.

The program runs on an IBM Personal Computer or compatible using DOS 3.0 or above and a Hayes-compatible modem. The software automatically dials up and interfaces with the mainframes to learn where and when a tank or boxcar was last seen, whether it was empty, which train was pulling it, what the equipment's destination was and other shipping facts, Martin said. Two rail companies have protocol quirks that were not addressed in BN Lynx. If one of the rail companies changes its interface, users can alter the appropriate field and save it, she said.

Burlington Northern customer representative Greg Oakley said BN Lynx ties in with mainframes at 10 other large rail firms.

Souerbry has been overseeing beta tests of BN Lynx Version 2.0. "It takes no more than 10 minutes usually to dial in on nine railroads," she said. Delta shares the information with shippers using its tanks.

BN Lynx is free to Burlington Northern's customers and sells for $350 to firms unlikely to ever use Burlington Northern trains. The firm has sold the source code to one other rail firm and is negotiating with another, Martin said.

Sizing systems to run X Window

BY JOANIE M. WEXLER
CW STAFF

Companies considering X terminals and worried about sluggish response time can check out host support capacity with a benchmark system recently introduced by A&T Systems, Inc. in Silver Spring, Md.

XMaster, an extension of the vendor's Benchmaster product, measures system or network response time by recording a live user application scenario and determining what response time would be in a configuration with more users.

X terminals are intelligent devices designed to run the X Window System, a networking protocol that allows users to access applications on multiple hosts and display them in separate windows on one screen. They are subject to unreliable response time because of possible network bottlenecks to the host and the inability to process applications at the desktop.

Alternatives to X terminals include personal computers and workstations; XMaster can reportedly also benchmark X Window applications in these devices.

XMaster captures information on a wide range of system components — including the CPU, I/O devices and controllers. The product makes a copy of all the work that is being done on the entire system in a specified time period and establishes a mock-up of the performance these activities would translate into when supporting larger numbers of users.

Its purpose is to help customers size their systems for X Window applications, company President Ashok Thareja said.

When running Benchmaster and XMaster, the driver machine must run "some flavor" of the Unix operating system but will test machines running any multitasking operating system, Thareja said. The software will also benchmark local-area network performance, as long as the LAN is communicating via Transmission Control Protocol/Internet Protocol or supports rlogin, a utility allowing users to log in from one host to another.

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NEW PRODUCTS

Electronic mail

Walker Richer & Quinn, Inc. has introduced Dispatch, a personal computer-based electronic mail management system for Hewlett-Packard Co.'s HP Deskmanager, an HP 3000-based E-mail system.

The system enables the PC to download, store and process messages and handle presentation tasks while the HP Deskmanager functions as a mail server and distribution system. Other features include automatic establishment of a host connection during message transfers to and from HP Deskmanager and the ability to schedule message exchanges during off-peak hours. Dispatch sells for $399.

Walker Richer & Quinn
2815 Eastlake Ave. East
Seattle, Wash. 98102
(206) 324-0350

Secured Communications Technologies, Inc. has announced a product that provides complete security for facsimile and electronic mail transmissions among banks, law firms and other organizations that need to protect critical data.

The Secom system uses channel secure technology to allow self-encryption of transmissions among IBM Personal Computers or compatibles via a Hayes-compatible modem over dial-up phone lines. The product lists for $695. A Secom Plus package includes an integrated fax scanner and sells for $1,295.

Secured Communications
1111 Jefferson Highway
Arlington, Va. 22202
(703) 486-1298

Sitka Corp. and Starnine Technologies, Inc. have developed an electronic mail gateway that provides enterprisewide communications among Unix Mail and Sitka's Inbox Plus E-mail program.

Mail*Link SMTP uses the Simple Mail Transfer Protocol (SMTP) to provide seamless peer-to-peer connections between Inbox Plus and other networks that support SMTP. It is said to enable Inbox Plus and Unix Mail users to send messages to each other without altering commands or the messages themselves.

License fees range from $249 to $4,950, depending on the number of users.

Sitka
950 Marina Village Pkwy.
Alameda, Calif. 94501
(415) 769-9669

Micro-to-host

Verbex Voice Systems, Inc. has announced a conversational voice I/O station for performing receiving, returns and inspection applications on an IBM 3270 or Digital Equipment Corp. VAX/VMS machine.

The Verbex Receiving Data Capture System features continuous speech recognition and enables users to create bar-code labels, tickets and control reports at a receiving workstation without any host involvement. The stand-alone system can be tied into a personal computer local-area network environment.

Pricing ranges from $1,750 per month for a single-operator station with a three-year lease to $2,600 per month for a four-operator system.

Verbex
1090 King Georges Post Road
Edison, N.J. 08837
(201) 225-5225

Gateways/Bridges/Routers

Andrew Corp. has announced a remote local-area network-to-IBM midrange computer system gateway.

Netlynx/5394 enables any Netbios-compatible LAN to communicate with a remote IBM System/34, 36 or 38 or Application System/400. The product is made up of a Synchronous Data Link Control interface board and a software package that enables each node on the LAN to emulate an IBM 5250 terminal.

Support is offered for LAN interfaces such as Arcnet and Ethernet and several file-transfer programs. The product lists for $1,995.

Andrew
2771 Plaza Del Amo
Torrance, Calif. 90503
(213) 320-7126

Electronic data interchange

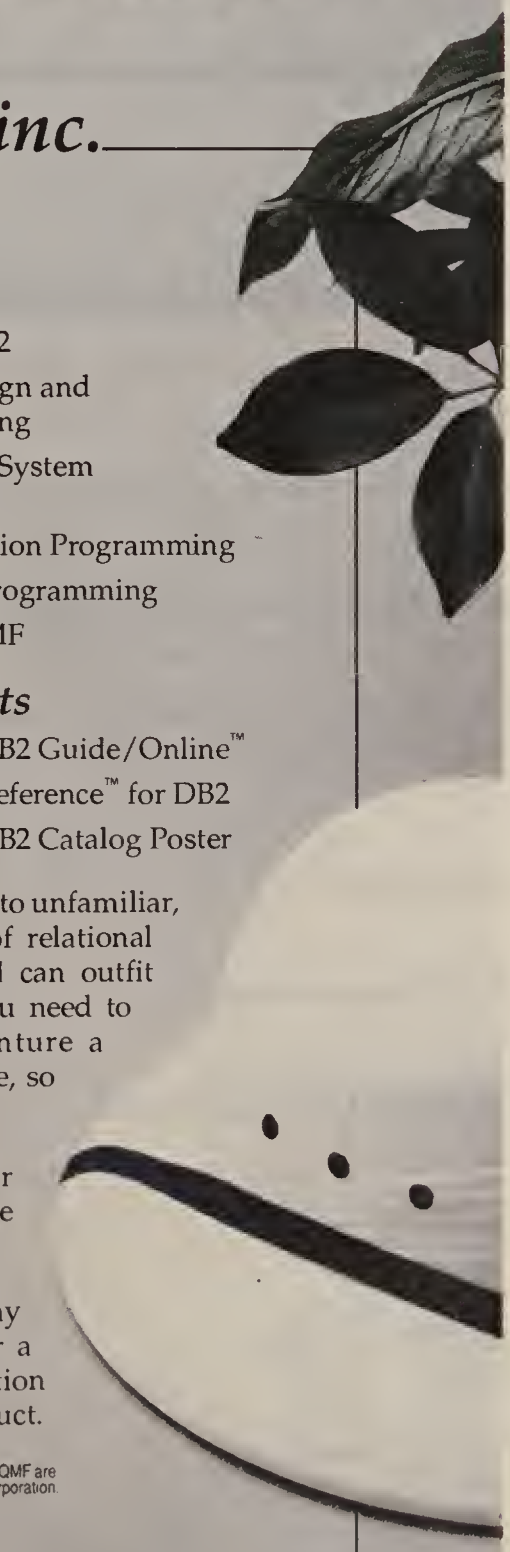
Harbinger EDI Services recently released an upgrade to its In-Touch*EDI electronic data interchange (EDI) software package.

Version 2.2 allows users to receive any EDI document or link EDI with internal applications. A binary file-transfer capability enables users to receive EDI standards and software updates, the vendor said.

The company has also announced In-Touch*EDI Plus, which can provide users with the power of an EDI front-end processor and the ability to exchange files with midrange, mainframe or personal computer applications.

Version 2.2 costs $1,295. In-Touch*EDI Plus sells for $1,995.

Harbinger
1800 Century Place
Atlanta, Ga. 30345
(800) 367-4272



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26. Talks to remote devices
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28. Talks to a PC emulating a coax terminal
29. Talks to a PC emulating an ASCII terminal
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31. Talks to DEC LAT networks
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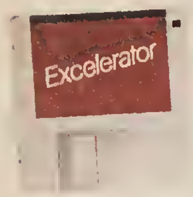

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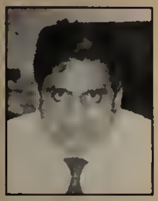
MANAGER'S JOURNAL

EXECUTIVE TRACK



Ramakrishna Eleswarapu has been named director of data and systems at the **New York State Insurance Fund.** Eleswarapu was formerly chief of data processing at the firm.

In his new position, he will oversee a computer network of 2,000 terminals in operation throughout the state, including the firm's home office in lower Manhattan and its seven district offices.

Eleswarapu has been at the agency since 1980, when he worked as a consultant with an India-based subsidiary of Unisys Corp. and became an employee in 1983 as director of systems and programming. He holds a bachelor's degree from Osmania University and an MBA from the Indian Institute of Management in Calcutta.

……

Also promoted at the **New York State Insurance Fund** was **Diana Bain,** who has been appointed assistant director of data and systems. She was formerly manager of data processing systems.

Bain began her career at the Fund as a programmer in 1980 and later advanced to senior computer programming analyst. In her new position, she will report to Eleswarapu.

Bain, who immigrated to the U.S. from Poland in 1962, holds degrees from Hunter College and New York University.

……

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A headache this big calls for PACS

Massachusetts hospital's project PACS reduces cost of storing imaging records

BY MICHAEL ALEXANDER
CW STAFF

Thanks to electronic diagnostic imaging technology, physicians now have gentler ways to accurately diagnose ailments than potentially destructive exploratory surgery. That's good news for patients — but a headache for hospital information systems managers.

Electronic diagnostic equipment churns out mountains of images per year, which are costly to maintain and overload manual record-keeping systems. "It's a nightmare," sighs Jaime Taaffe, director of computing for the department of radiology at Massachusetts General Hospital (MGH) in Boston.

MGH employs 59 people whose sole job is to store, retrieve and shuttle the images generated by electronic diagnostic equipment among departments.

Ironically, automation — which has caused the imaging crush — is also being sought as a means to help ease the economic and administrative burdens of storing and using records on paper, film and other media.

Stella Johnson

MGH's Taaffe *expects PACS project to reduce hospital's imaging crush*

MGH, which is affiliated with Harvard University's Medical School, maintains three film libraries to house the millions of images generated by the radiology department each year. Images already occupy one acre of floor space at the hospital's main film library a few miles away in Somerville, Mass.

The Department of Radiology conducts 340,000 radiology exams per year, resulting in 5 terabytes — 5 *trillion* bytes — of images.

"We're now at 5 terabytes, and we're not keeping all of it," Taaffe says. "We're looking at keeping 6 terabytes of data per year."

In an attempt to manage this mountain of information, MGH's Radiology Department is preparing to launch the second phase of an ambitious project called the Picture Archiving and Communications System (PACS). The project is intended to help solve the problems of storing, retrieving and distributing images — and will also help generate income for the world-renowned hospital.

PACS, which is based on a network of workstations called Quick-Radiology Storage Transfer Analysis (Q-RSTAR), has been under development for about 18 months and will be up and running before the end of the year (see story page 72). The system is designed to capture, store and transmit all kinds of images as well as graphics and voice, making it one of the first multimedia applications of its kind to be installed anywhere.

The first phase of the PACS project was based on a system called Micro Radiology Storage Transfer Analysis. It was intended to demonstrate to radiologists and other professionals the kinds of technology available and to provide a basis for discussion about what such a system would require if it

Continued on page 72

CIOs: Much more than figureheads

BY ALAN J. RYAN
CW STAFF

In the early 1980s, the term "chief information officer" had not yet been coined. By the close of the decade, CIOs were popping up everywhere but still functioning as information systems managers.

Now, according to a study by Mountain View, Calif.-based Input, the CIO's power is expanding, and he is finding himself in a position of unfamiliar influence. The study, "The Future of Information Systems Management," found that CIOs play a significant role as their firms move toward global competition and the exploitation of information resources as a competitive weapon.

Because of the increased competition, pressures for shortened product development cycles, shortened manufacturing cycle times and consistent reductions in time-to-market have resulted and are intensifying, according to the report.

INPUT

CIOs listed their primary objective as "integrating business and technology; to serve as an educator and communicator, while driving the IS function to support business rather than technical goals." The emphasis is on directing or driving rather than managing the function, and the focus is on its integration within the business, the report said.

According to Input, key future trends affecting the CIO are increasing levels of integration, extended use of communications systems and emphasis on business planning. The CIO will spend time looking to integrated databases, platform independence/systems connectivity, computer-aided software engineering technologies, expert systems and on-line transaction processing capabilities.

CIOs who were polled listed image processing, voice recognition, natural language processing and self-teaching expert systems as the top four emerging technologies. Input interviewed more than 30 IS executives and industry experts for the survey.

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COMMENTARY

Max Messmer

Punch a hole through the No-Zone Layer

While the information systems department should be at the forefront of change, it faces the same problems that are endemic to the rest of the organization. As IS organizations mature, they tend to put more of their energy into maintaining old ways of doing things instead of initiating new activities with potentially higher productivity.

As a result, they often develop what I refer to as a "No-Zone" Layer. This is a layer of negativity that hangs like a ceiling over an IS staff, suppressing their natural initiative. The layer grows and thickens over time, fed by the repeated "no's" people hear when they propose a new idea.

IS managers overtly cast the No-Zone Layer over employee initiative with responses such as the following: "Yes, a 4GL would really reduce development costs, but then we would have to find new jobs for half the maintenance programmers" or "Unix workstations make a lot of sense for software engineering, but Joe in IBM technical services would never buy off on it, so let's not even bring it up."

Managers inadvertently squash good ideas through benign neglect, banishing creative solutions to languish in the No-Zone Layer. They do this with responses such as: "Great idea. Let's set up a task force to explore it," or "CASE tools make sense, but let's see if we finish the year with some budget left over to cover the education costs."

While inertia is difficult to overcome, it is possible to break through the No-Zone Layer. To do this, the concept of making applications as user-friendly as possible applies equally to your own personal management style.

The kind of entrepreneurial spirit that encourages problem-solving and risk-taking comes from individuals — not organizational charts.

Here are suggested techniques for helping IS managers punch some holes in the No-Zone Layer.

- **Assess your own No-Zone quotient.** A new approach must come from within. Have a private talk with yourself. Try to list all the times you've shrugged off someone else's ideas, and analyze why you did that. Did you really think it wasn't a good idea, or was it just getting in the way of your own plan?

> THE IS DIRECTOR of one of our client companies issues rewards for "smart mistakes" on a regular basis. He does it to show employees that he really does encourage and value smart risk-taking and that he expects risk to sometimes result in mistakes.

- **Demonstrate your own user-friendliness.** Not only is it OK to argue both sides of an argument in front of people, but it's also the only way you'll loosen them up to feel comfortable in taking risks themselves. The most visionary, creative and innovative ideas often sound offbeat when first uttered. Once people learn that you're open to exposing and publicly exploring your own ideas and concerns, they in turn will open up with their best, most creative thinking.
- **Go to bat for your people.** If you think something is a good idea, the fact that your boss or the telecommunications manager doesn't think so at first glance is not a legitimate excuse for shooting it into the No-Zone Layer. If you won't go to bat for your people, all you've accomplished is to push the No-Zone Layer one level higher in the organization.
- **Evangelize.** Excitement is contagious. Fire up your peers and people above you over what you are trying to accomplish. They might not become believers overnight, but at least they'll make an effort to support you over the short term, which gives you time to produce concrete results.
- **Remember that "strategy is the art of experimentation."** Try to become more comfortable and confident in the role of risk-taker. Once you've decided to champion an idea, give it its absolute best chance to succeed. If it doesn't, you've still made progress by learning an important lesson that will build a stronger strategy going forward.
- **Reward risk as well as results.** The IS director of one of our client companies issues rewards for "smart mistakes" on a regular basis. He does it to show employees that he really does encourage and value smart risk-taking and that he expects risks to sometimes result in mistakes.

Strike out on your own to break a hole in your No-Zone Layer. Soon, other departments will begin to notice your results and be more supportive of your desire to introduce new systems.

Go about it in whatever creative manner works best for your individual style, with one major exception: Don't set up a task force.

Messmer is chairman and CEO of Robert Half International, Inc., a Menlo Park, Calif.-based IS placement service operating Robert Half and Accountemps divisions.

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BOOK REVIEW

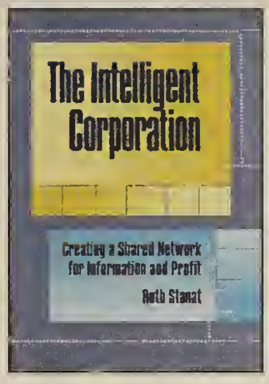
How to put those heaps of data to work for you

THE INTELLIGENT CORPORATION: CREATING A SHARED NETWORK FOR INFORMATION AND PROFIT
By Ruth Stanat
Amacom Books, $24.95

I've often wondered how companies manage to juggle the myriad considerations that go into building corporate networks without screwing up the whole system and costing the corporation millions. Now I know: They read books like *The Intelligent Corporation.*

The book provides a structure for corporations struggling to make strategic use of the mounds of information that are now so easy to get but so difficult to manage. Author Ruth Stanat digests a complex range of business issues into one convenient little handbook that many managers probably wish they had time to compile for themselves. The book shows no hint of techno-jargon; it is truly a manager's how-to, written in businessese.

As a framework for thinking, the book delineates the financial, political and cultural issues companies must consider as they embark on a systematic approach to information gathering, sharing and maintenance.


The Intelligent Corporation
Creating a Shared Network for Information and Profit
Ruth Stanat

This momentous task is put into manageable perspective by a "how-are-we-doing?" gauge that guides the reader through an information audit for measuring the network against the bottom line.

In her wisdom, the author doesn't present a single "correct" networking scenario for every company. Rather, she organizes the corporate manager's mental "things to do" list by providing a step-by-step procedural shell into which readers can drop their own set of circumstances.

Targeting strategy, pricing and sales information as the most valuable competitive information in today's corporate environment, Stanat provides concrete suggestions for integrating the most likely sources of that information: the sales force, customers and the trade press.

She suggests a flexible, phased approach to evaluating, planning, implementing and integrating systems that will accurately reflect the needs of the business and protect existing capital investments. She factors in such industry trends as corporate decentralization, downsizing through the elimination of middle managers, the global expansion of many corporations and the burgeoning role of the corporate marketing research department.

Stanat insists that companies designate an internal champion for the network as a central coordination point and identifies the desirable qualities in such a candidate, including in-depth company knowledge, a willingness to take risks and a results-oriented philosophy. She offers such concrete tips as suggesting that the champion and network administrator make a two-year commitment to the project and offers target time periods for each phase of network development.

This tangible advice, along with the network-building experiences of firms such as Citibank, General Electric Co., AT&T and Ford Motor Co., make this book much more than just blue-sky managerial philosophy. It is something you can get your arms around and use.

For example, it tracks the progress of a centralized GE in the mid-1980s in providing divisional managers with analysis of raw data.

Stanat emphasizes that the invaluable corporate database should reflect how management of the organization views the business. She weighs the pros and cons of internal development vs. outsourcing and offers ways to discourage the "information hoarding" practice.

The book also provides sample questionnaires for department interviews that help assess the internal resources available for intelligence gathering.

Stanat seems to have the credentials for offering all this advice. In addition to holding advanced degrees in finance and statistics, she has 20 years of experience in marketing and planning at Fortune 500 firms, where she witnessed both the success and downfall of information-gathering endeavors.

One point of contention: The author is founder and president of a database publishing firm that also offers consulting services. She continually mentions the option of outside assistance, which could be interpreted as a plug for her company. However, the consultant alternative is always responsibly balanced with the in-house option, so I guess we shouldn't hold the author's possible vested interest against her.

The book also seems a little pricey; it contains about 250 airy pages of large type and oversized flow charts that aren't particularly helpful. But I suppose for the manager who discovers one key idea between the covers, $24.95 will seem like a real bargain.

JOANIE M. WEXLER

Wexler is a *Computerworld* senior writer.

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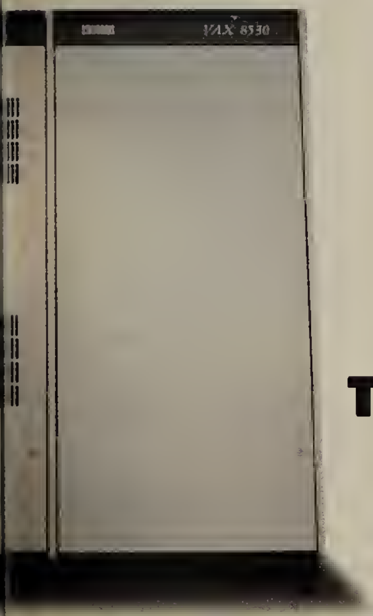

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PACS

CONTINUED FROM PAGE 67

were to be clinically useful.

The goal of Q-RSTAR is to find out whether it is possible to rapidly transmit high-quality images among the hospital and five Boston-area sites: the main film library in Somerville, a magnetic resonance facility in Charlestown, the PACS development center in Cambridge and a hospital and a health maintenance organization (HMO), both in suburban Boston. At the moment, the images are transported between sites on an hourly shuttle bus.

The images will be viewed on Apple Computer, Inc. Macintosh workstations with high-resolution monitors or printed on a laser printer.

"The docs wanted to see originals, but they will adapt," Taaffe says. "The information goes faster to them, and the information is just as good. The answer is that if technology provides better care faster, they will adapt."

Still, designing systems to be used by highly specialized physicians with little computer awareness is a challenge. Based on a previous test, the PACS development team was convinced of the need to have a "capable, forgiving, yet simple user interface," Taaffe says.

"The doc interface has to be radically different than that of an engineering workstation," he says. "Medicine or radiology is visually thin; the interface is not a lot of dialog boxes or menus, but behind it is a lot of heuristics and artificial intelligence." The interface, which was designed in-house, adapts over time so that it becomes easier and faster to use. "The workstation observes what users want and tailors itself, instead of the user tailoring to the system," Taaffe explains.

In the health care industry, the problem of storing and retrieving images will become more acute for the following interrelated reasons, according to many health care professionals:

- Electronic diagnostic equipment generates more types of images than ever before. In addition to X rays, there are spectroscopy, magnetic resonance, nuclear medicine, ultrasound and several other types of imaging technologies. There are some 30 different classes of images, with "no end in sight," Taaffe says.
- Diagnostic equipment is being used to produce more images faster per examination. A magnetic resonance imaging scanner can generate 600M bytes of data in only 20 minutes, for example.
- Health care professionals are requesting more exams, mainly to boost patient care but also to justify the expense of imaging equipment that can often run into the millions of dollars.
- More health care professionals are involved in the treatment of a patient, and each wants to see the original images, thus requiring that images be transported between several locations and tracked.
- Instead of discarding patient images after a few years, hospitals are keeping them longer. Soon, they will keep a patient's records for his entire life.

Taaffe succinctly sums up these prospects for the IS manager: "It's a nightmare."

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Massachusetts General Hospital has spent several years developing a Picture Archiving Communications System (PACS) aimed at helping it get out from under the "crushing weight of images," according to Jaime Taaffe.

In the second phase of the PACS project, Taaffe is overseeing the installation of a network of workstations called the Quick-Radiology Storage Transfer Analysis and Reporting System (Q-RSTAR).

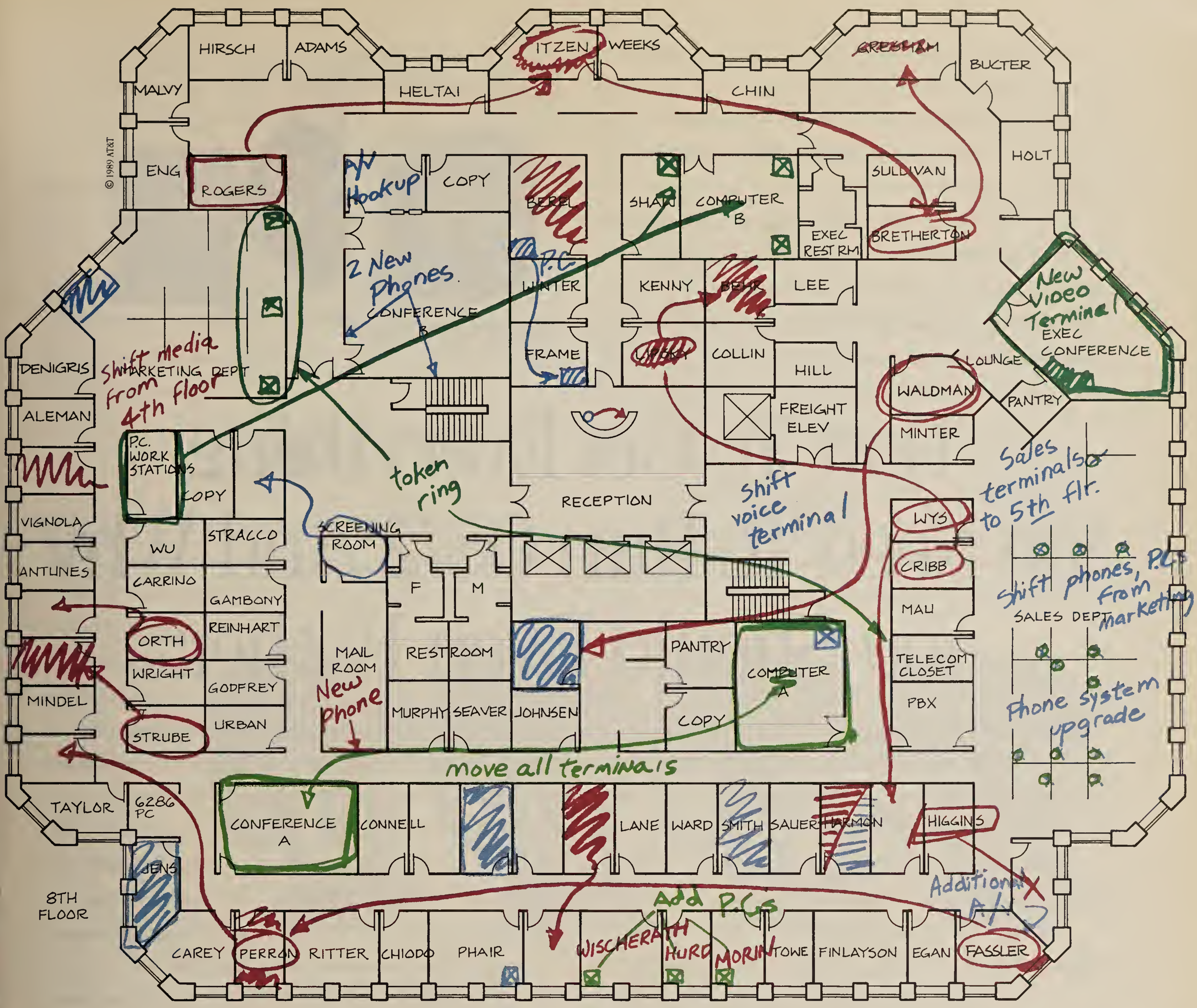
There will be 16 Apple Macintosh workstations in Q-RSTAR once the network is operational later this year. Each will be equipped with either a medium- or high-resolution workstation capable of displaying magnetic resonance imaging, nuclear medicine, radiographs and other sorts of images produced by electronic diagnostic gear. The workstations will also display animation and "cini-loops" — short clips of film.

Shared among the workstations is a multiplexed, 40 million instructions per second image processor capable of more than 80 million floating-point operations per second and constructed from multiple Mercury Computer Systems, Inc. array processors. The overall system is controlled by a Digital Equipment Corp. VAX 6220 with 64M bytes of main memory allocated solely for the Q-RSTAR project.

The workstations will communicate over an Ethernet local-area network for command and control information and a variety of high-bandwidth "image blasters" to speed images within MGH's main campus and a Charlestown facility.

"The image transfer rate is 12M bit/sec. or 17 million pixel images per second," Taaffe says. "If you don't get this kind of performance, no one will use it."

MICHAEL ALEXANDER



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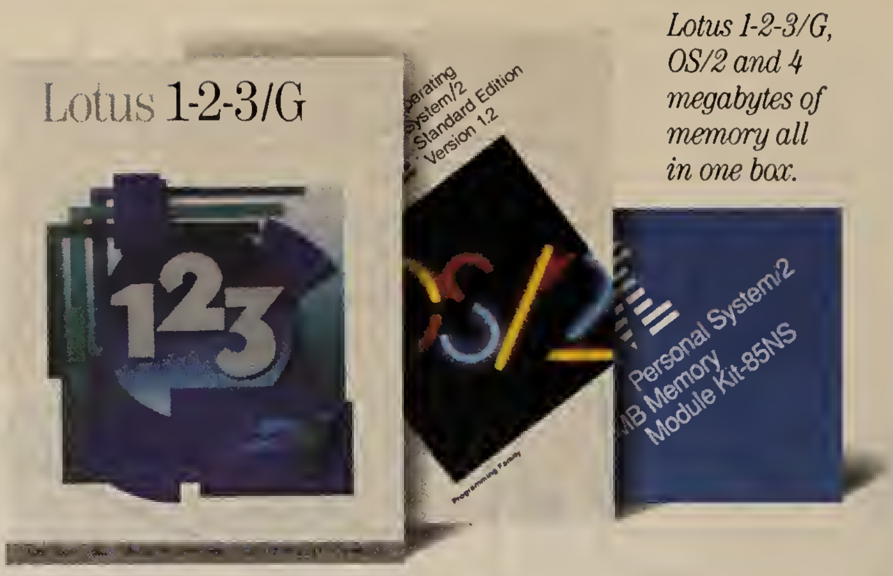
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If you're a current 1-2-3 user, you'll be happy to know that all data and macros created in existing versions of 1-2-3 can be retrieved directly into 1-2-3/G. So a move to OS/2 will only serve to enhance any investment you may have already made in 1-2-3.

But how does OS/2 make 1-2-3 better? Well, besides introducing 1-2-3 to a graphical environment, OS/2 works harder and faster, so 1-2-3 can work harder and faster for you.

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With OS/2, 1-2-3/G can give you Dynamic Data Exchange. DDE provides live links to other Presentation Manager™ applications for true application integration.

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At this point, you're probably thinking, "Enough, I'm convinced." But just in case, we'd like to bring you up to date on OS/2.

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CALENDAR

JULY 29-AUG. 4

AI-1990 Conference. Boston, July 29-Aug. 3 — Contact: American Association for Artificial Intelligence, Menlo Park, Calif. (415) 328-3123.

Insourcing vs. Outsourcing: The Summit Meeting. Atlantic City, July 31-Aug. 1 — Contact: The Yankee Group, Boston, Mass. (617) 367-1000.

Mid-Atlantic Storage Management Association Forum. Philadelphia, Aug. 1 — Contact: Randall Lebedz, MASMA, P.O. Box 391, Manville, N.J. (201) 526-9325.

Computer Security in the '90s Conference and Exposition. Atlanta, Aug. 1-3 — Contact: Inforum, Atlanta, Ga. (800) 343-5048.

Object-Oriented Design and Programming seminar. Montreal, Aug. 2-3 — Contact: Darcy Harrison, Interactive Software Engineering, Goleta, Calif. (805) 685-1006.

AUG. 5-11

Uniforum Open Systems Seminar. Chicago, Aug. 6 — Contact: Uniforum, Santa Clara, Calif. (408) 986-8840.

Managing Information Resources in the '90s: A Fresh Start. Princeton, N.J., Aug. 6-9 — Contact: Louise Spieler, National Association of State Information Resource Executives, c/o the Council of State Governments, Lexington, Ky. (606) 231-1870.

North American ISDN Users' Forum. Gaithersburg, Md., Aug. 6-9 — Contact: Lori Phillips, NIST, Gaithersburg, Md. (301) 975-2937.

Siggraph '90. Dallas, Aug. 6-10 — Contact: Siggraph '90, Chicago, Ill. (312) 644-6610.

Introduction to AIX System Administration. Toronto, Aug. 8-10 — Contact: Judy Neumann, Bragen Group, Toronto, Ont., Canada (416) 366-6363.

AUG. 12-18

The Urban and Regional Information Systems Association. Edmonton, Alta., Aug. 12-16 — Contact: URISA, Washington, D.C. (202) 289-1685.

SHARE 75. New Orleans, Aug. 12-17 — Contact: SHARE Headquarters, Chicago, Ill. (312) 644-6610.

Downsizing Conference: Moving from Mainframes to PCs. Boston, Aug. 13-14 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

Windows/Fall Conference and Exposition. Boston, Aug. 15-17 — Contact: CM Ventures, Emeryville, Calif. (415) 601-5000.

AUG. 19-25

Relational Today Seminar. Palo Alto, Calif., Aug. 20-21 — Contact: Codd and Date, San Jose, Calif. (408) 441-6400.

Eastern Regional ISSA Conference. Washington, D.C., Aug. 19-21 — Contact: Ralph S. Poore, Baltimore, Md. (301) 783-3865.

Strategic Information Systems Conference. Boston, Aug. 20-21 — Contact: University Seminar Center, Boston, Mass. (617) 248-8066.

Summer Workshops for the Information Processing Professional. Nashua, N.H., Aug. 20-23 — Contact: Ouellette & Associates, Bedford, N.H. (603) 623-7373.

SCO Forum '90. Santa Cruz, Calif., Aug. 20-24 — Contact: The Santa Cruz Operation, Santa Cruz, Calif. (408) 425-7222.

Early, Cloud & Co.'s Summer Conference on Telecommunications. Newport, R.I., Aug. 22-23 — Contact: Early, Cloud & Co., Newport, R.I. (800) 322-3042.

AUG. 26-SEPT. 1

National Computer Graphics Association Conference and Exposition. Houston, Aug. 26-29 — Contact: NCGA, Fairfax, Va. (703) 698-9600.

Unix Security Workshop. Portland, Ore., Aug. 27-28 — Contact: Usenix Conference Office, El Toro, Calif. (714) 588-8649.

CASE for the 1990s. Boston, Aug. 27-29 — Contact: Extended Intelligence, Chicago, Ill. (312) 346-7090.

SEPT. 2-8

FED Micro '90. Washington D.C., Sept. 5-6 — Contact: National Trade Productions, Alexandria, Va. (703) 683-8500.

Strategic Planning for Information Systems. Toronto, Sept. 5-7 — Contact: Barnett Data System, Rockville, Md. (301) 762-1288.

SEPT. 9-15

Adding Image Processing to Information Systems. Toronto, Sept. 9-11 — Contact: Technology Transfer Institute, Santa Monica, Calif. (213) 394-8305.

Open Systems Applications Development Conference. San Jose, Calif., Sept. 9-12 — Contact: Unify, Sacramento, Calif. (916) 920-9092.

Implementing TCP/IP for Systems Integration. Washington, D.C., Sept. 10-11 — Contact: Data-Tech Institute, Clifton, N.J. (201) 478-5400.

Executive Information Systems: From Planning to Implementation. San Francisco, Sept. 10-12 — Contact: Technology Transfer Institute, Santa Monica, Calif. (213) 394-8305.

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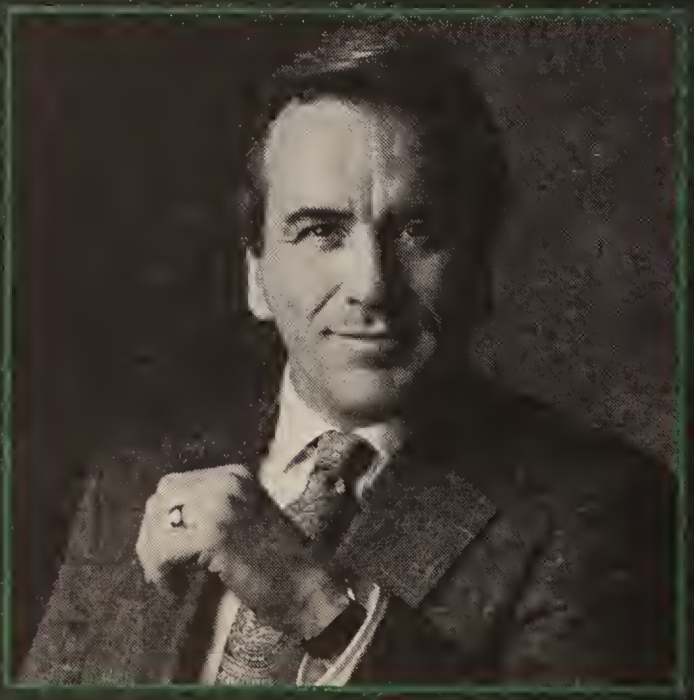

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PRODUCT SPOTLIGHT

EXECUTIVE INFORMATION SYSTEMS

What color is your EIS?

BY EILEEN CARLSON

Defining an executive information system (EIS) calls to mind the old TV game show *What's My Line?*, where through a series of questions, panel members tried to determine the occupation of an anonymous contestant.

A lot of people are stumped by what an EIS actually is, and that is understandable. Until a year or so ago, it was easy to point at three vendors and say, "they sell an EIS."

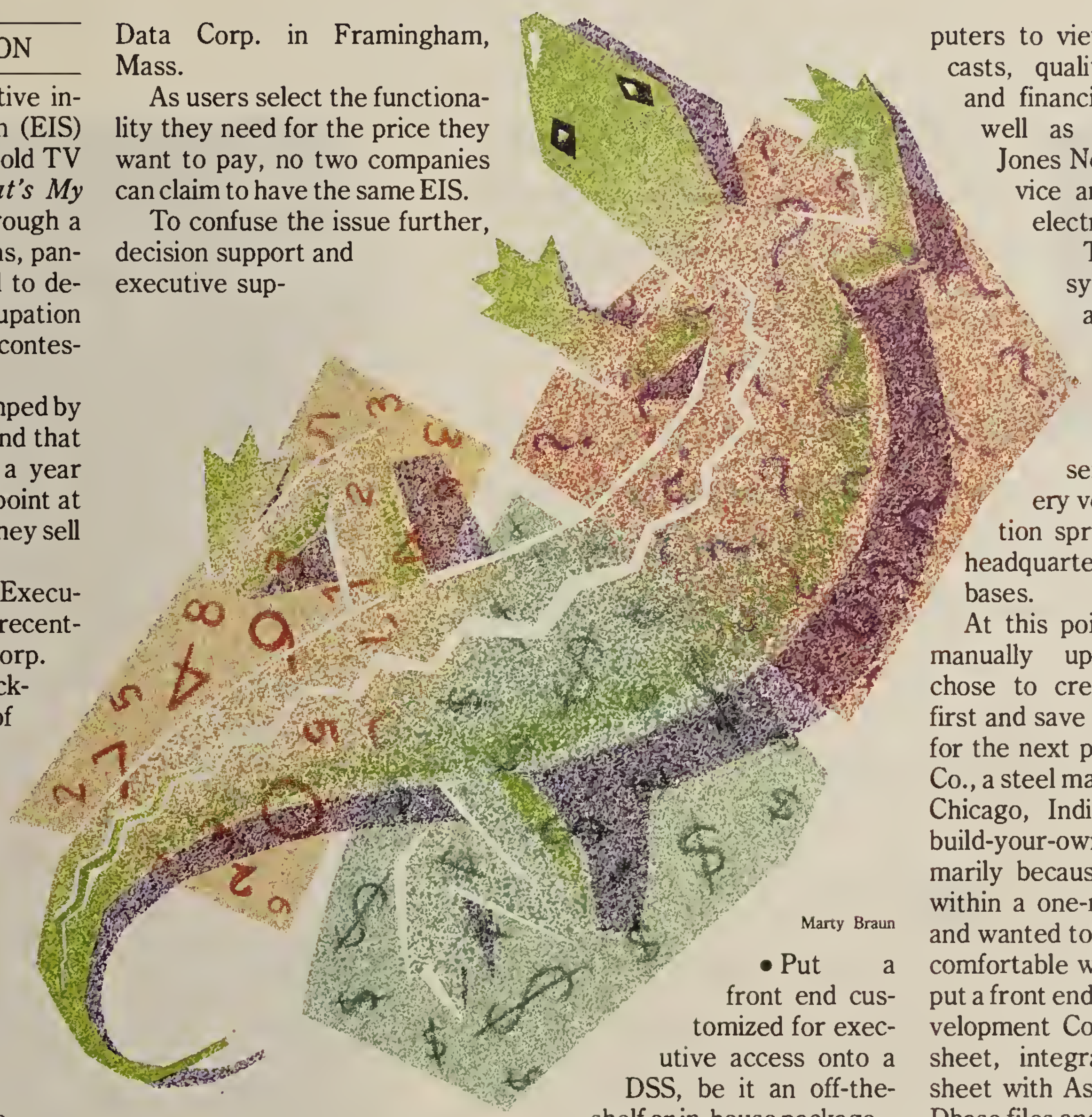
Comshare, Inc., Pilot Executive Software and, more recently, Execucom Systems Corp. all offered software packages in the price range of $100,000 to $200,000, and all offered an easy-to-use interface, access to databases throughout and external to the organization, drill-down capacity, exception reporting and combinations of graphics and text to capsulize information for the busy executive.

During the last couple of years, however, more products have hit the market; while some of these claim full functionality, most are scaled-down versions of EIS or tools to help users build their own systems. With these alternative routes, the definition has become a little more hazy, with enhanced spreadsheets, EIS front ends, prototyping tools and even fourth-generation languages (4GL) vying to fit into the category.

People are looking beyond the "big three" and studying these alternatives. In fact, as many as 50% of all EISs currently in place and one-third of those planned at IBM mainframe installations will be generated from application development tools, according to Clare Gillan, senior analyst for application solution software at International Data Corp. in Framingham, Mass.

As users select the functionality they need for the price they want to pay, no two companies can claim to have the same EIS.

To confuse the issue further, decision support and executive support system (DSS, ESS) characteristics are creeping into commercial and homegrown EIS systems, stirring debate as to how much of a role they need to play and to whom these systems are most valuable.



Marty Braun

The paths that users can take to achieve some degree of EIS functionality are numerous, including the following:

- Build an EIS using in-house tools such as a spreadsheet, 4GL, applications generator, programming language and their favorite graphics software.
- Put a front end customized for executive access onto a DSS, be it an off-the-shelf or in-house package.
- Use a vendor EIS package to display a handful of reports to a small group of executives.
- Build robust applications with a vendor EIS package for a large number of executives and managers.

However, for each path taken, functionality differs widely. Consider the following three approaches, in ascending order of sophistication:

At Motorola Corp.'s corporate headquarters, 45 executives — from the chairman of the board to the assistant general manager — use personal computers to view economic forecasts, quality measurements and financial information as well as access the Dow Jones News/Retrieval service and the mainframe electronic mail system.

The in-house-built system is based around a graphical interface, which took about one year to develop. This interface serves as the delivery vehicle for information sprinkled throughout headquarters in various databases.

At this point, the system is manually updated. Motorola chose to create the interface first and save the feeder system for the next phase. Inland Steel Co., a steel manufacturer in East Chicago, Indiana, also took a build-your-own approach, primarily because it was working within a one-month time frame and wanted tools that they were comfortable with. The company put a front end onto its Lotus Development Corp. 1-2-3 spreadsheet, integrated the spreadsheet with Ashton-Tate Corp.'s Dbase files and used some add-in products to write custom applications.

The finished system accesses financial, marketing and human resources databases and brings this summary data into the file server. Forty people — from the vice-president of manufacturing down to the section managers — currently use the system, which provides a drill-down function and ad-hoc queries.

While Inland had intended to finesse the system with an off-the-shelf EIS after presenting it to executives, the users were so happy with the results that it no longer seemed necessary. These executives are somewhat technically oriented and don't mind typing in a few extra commands, as opposed to icons.

The fact is that drill-down on the Inland system differs from what an off-the-shelf package would offer. Drill-down in the strict sense means that by clicking on or touching an item on the screen, users access more

---

Carlson manages the EIS services area at Integrated Technologies, Inc., a consulting firm in Rolling Meadows, Ill.

INSIDE

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What executives would really like to see in their EIS. Page 85.

Buyers' Scorecard
Pilot edges out Comshare in user ratings of EIS software. Page 88.

True Stories
Michigan Senate becomes first legislative body with an EIS. Page 86.

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In the terminology of the modern workplace, power and speed have become the shorthand by which personal computers are measured.

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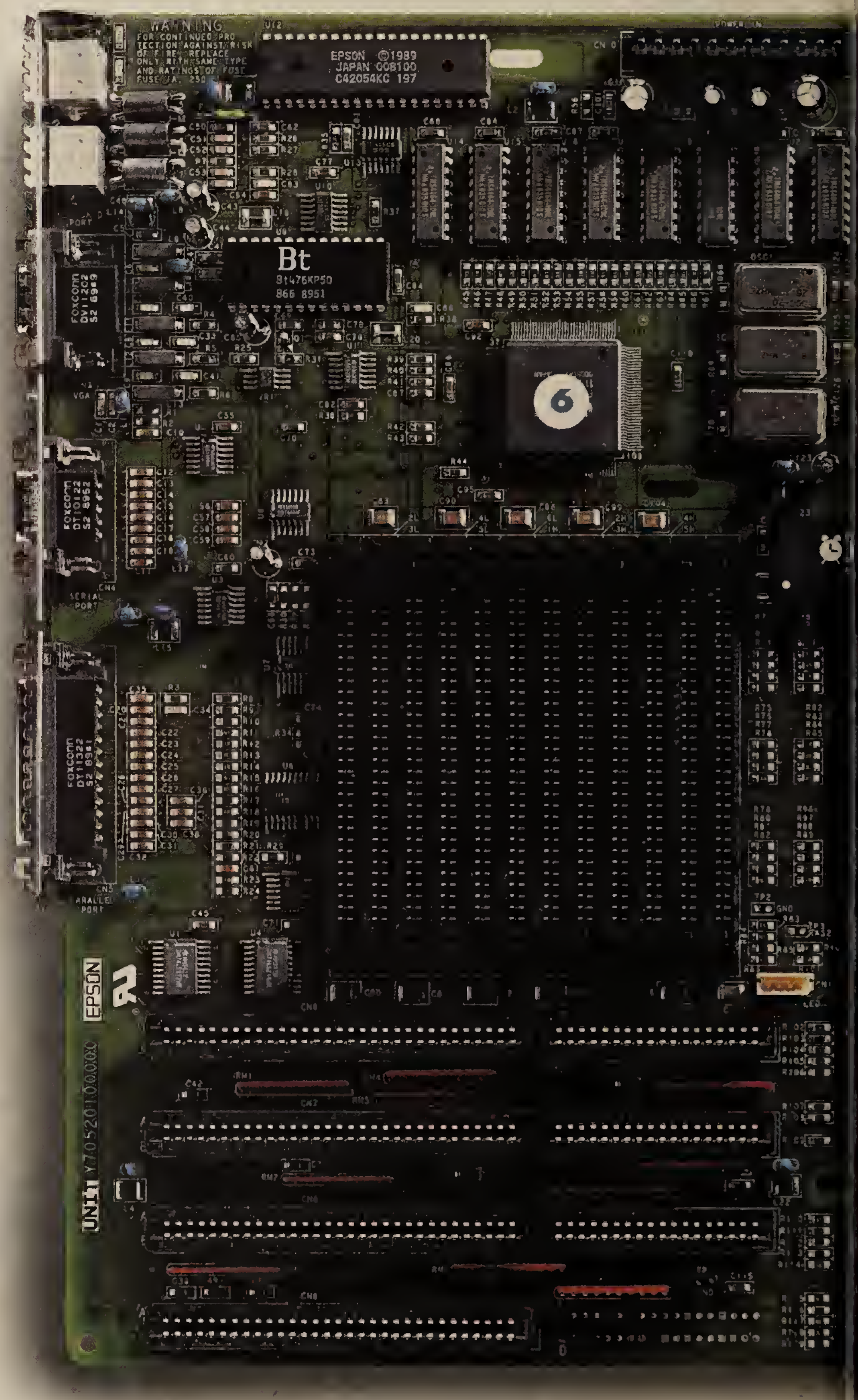
③ *Hard Drive Controller. The use of Integrated Drive Electronics on the hard disk eliminates the need to add a hard disk controller board. This simplified design means faster throughput and greater reliability.*



Epson's 386SX motherboard displays the elegant architecture necessary for optimal performance.

Feature configurations may vary with different models. Board shown is not actual size. 386 is a trademark of Intel Corporation. Epson is a registered trademark of Seiko Epson Corporation. © 1990 Epson America, Inc., 2780 Lomita Blvd., Torrance, CA 90505. **(800) 922-8911.**

t in a world obsessed

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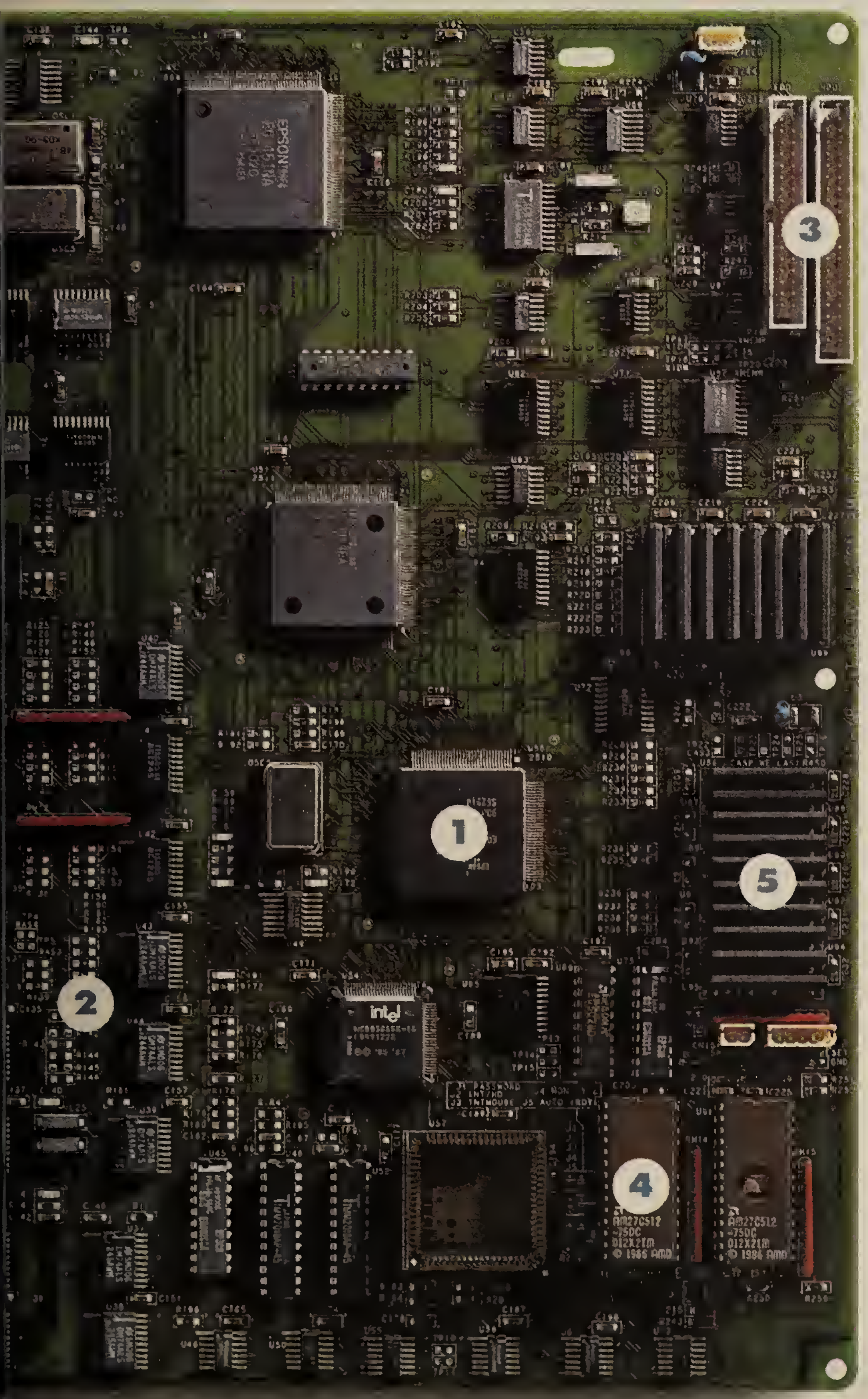

❹ *Epson's proprietary BIOS. Epson has elected to develop its own BIOS, customized for each individual system, simply to ensure that your software will get the most out of our hardware.*

❺ *High speed memory. In fact, at 70 nanoseconds, they are among the highest speed memory chips available. With them, memory access is faster. Snap-in SIMMS modules make memory upgrades easy and quick.*

❻ *Super VGA video graphics are embedded on the motherboard. The result: more efficient data transfer, more reliable circuitry, optimized video performance.*

What the Epson design team has discovered is that *less* is very definitely more. By reducing the number of separate components through integration, performance is increased. The result is a flexible tool which is elegant, efficient and allows the effortless application of power and speed to the task at hand.

In fact, there is only one word that adequately describes the innovative design of these new Epson computers. Neat.

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EIS

CONTINUED FROM PAGE 79

detailed information, whether it's in graphical or textual form. On the Inland system, users hit "page-down" and merely see more preset screen detail, not information relating to any particular item. Additionally, the Lotus graphics are not as high-quality as a vendor package.

Stone Container Corp., on the other hand, began with a custom-built system and replaced it with Pilot's Command Center after the first attempt "didn't work out too well," according to Donna Dreczko, project manager of EIS.

Dreczko attributes the failure to the system's use of function keys and the fact that there were no icons or graphics; users selected menu items with a text-based interface.

The new system clearly displays applications in five colored boxes that executives touch for more detailed information.

The system was implemented in two months and runs five applications, including accounts-receivable, orders, shipments, production and backlog. Users range from the chief executive officer to the senior vice-presidents from each functional area.

When considering what off-the-shelf packages have to offer, it becomes clear what an EIS *can* do. Comshare's Commander offers two primary applications — Briefing Book and Execuview. With Briefing Book, information is downloaded from the mainframe to a PC. With standard reports, drill-down, color-coding, trend analysis and commentary features, the product presents the user with his own customized EIS.

Execuview's Executive Edge handles ad hoc reporting, where the executive views the data from the mainframe, file server or PC. The product was designed to work with System W or One-Up, Comshare's DSS products.

Execucom, on the other hand, works with preformatted templates, which a company writes applications to fit.

Pilot's Command Center offers drill-down, trend analysis, exception reporting and ad hoc query. It also offers a number of code generators, including Advantage, Dimension and Multipath.

Roads taken

A large percentage of companies, however, willingly give up some of the functionality of the vendor packages, believing they can do so for a fraction of the software cost. In addition, they see no reason to pay so much for software that requires a huge degree of customization — usually one to six months worth before an application is up and running.

One homegrown approach is to use a very powerful 4GL product to provide EIS capabilities.

One such product comes from Information Builders, Inc., which just released Focus EIS. Focus EIS sells for $995 per copy and requires either PC Focus, which lists for $1,295 per copy, or the mainframe version, which costs $180,000.

Focus EIS uses drill-down, trend analysis and exception reporting to improve data access and reporting capabilities for systems built in Focus or PC Focus. Its open architecture allows access to data across many platforms.

Information Builders claims you can bypass the mainframe Focus database and go right to the source systems; however, the ideal method is to pull data from the different sources, bring the data into the Focus database and then present it to executives with Focus EIS.

In addition, Focus EIS is ideal for companies that already have a sophisticated Focus database.

Prototype, then implement

Another approach is to first prototype and then implement a production system. Two products commonly used for this purpose are American Information Systems, Inc.'s Redimaster and Interactive Image's Easel.

At Central and South West Services, a Dallas-based holding company for four electric companies and a gas pipeline company, "The prototype approach was a lot more attractive to our management than making an up-front commitment and going with any of the particular EIS products," says Dick Groff, manager of planning.

Central and South West chose Easel, a general-purpose screen design and prototyping tool. The product creates screens from mainframe databases to present on a PC, complete with color-coding, graphical trends and drill-down capabilities.

It took the IS department about eight weeks to create a demo for the eventual EIS. It included three modules, showing operational information, status reports and organizational charts. From there, six months were spent preparing a more in-depth prototype and standardizing on the use of the three applications.

The project is now on hold until strategic plans are finalized. Nevertheless, it is still less expensive to have a prototype fail than a full-blown EIS.

One drawback to sticking with an EIS created in this manner is that once you enter production mode, maintenance becomes costly and difficult. Each screen that is displayed to the end user has several PC files associated with it, each of which needs to be maintained. If the executives decide they'd like a change in screen format, it is a big job, since hundreds of screens may be at stake.

Another way to start small is to take a departmental, distributed approach with a LAN-based system.

"The architecture of the future will be an intelligent workstation providing the human interface and personal productivity functions," says Richard Crandall,

Continued on next page

Where does the money go?

Financial applications are the most popular EIS users, with sales numbers a close second

Function	Application	Percent cited
Finance	Budgeting/Forecasting	64%
Human resources	Head-count reporting	36%
Marketing	Sales forecasting Sales/Share reporting	56%
Manufacturing	Inventory management	20%
Sales	Sales reporting	45%

Percent of respondents, base of 132 (multiple responses allowed)

Source: Pizzano & Co.

CW Chart: Doreen Dahle

Common ground

EISs vary widely in functionality; however, the following are the most common features found in "full-function" products such as those from Comshare, Inc., Pilot Executive Software, Execucom Systems Corp., Information Resources, Inc. and IBM's Executive Decision, according to Hugh J. Watson, director of MIS programs and EIS projects in the department of management at the University of Georgia:

- Support for multiple-user interfaces.
- On-line, context-dependent Help screens.
- Command files.
- Multiple methods for locating information.
- Access to external databases (such as Dow Jones News/Retrieval).
- Interfaces to other software (such as IBM's Professional Office System, Lotus Development Corp.'s 1-2-3).
- Integrated decision support (such as System W, IFPS).
- Easy screen design and maintenance.
- Screen design templates.
- Application shells.
- Data extraction from existing organizational databases.
- Graphical, tabular and textual information on the same screen.
- Integration of data from different sources.
- Security for data, screens and systems.
- Support for rapid prototyping.

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Continued from page 82

president of Comshare. "These will have engines behind the scenes performing the bigger analytical and data management work," he says.

Abbott Laboratories went with Comshare for just this distributed approach. "We could offer executive information systems without them becoming incredibly costly because the preponderance of the work is handled on the PC while the executive is using it," says Nancy C. Boyd, a consultant in the firm's corporate MIS department.

Central and South West's Groff *says prototype approach is preferrable*

Another downscaled approach to PC-based EISs is offered by Channel Computing, Inc.'s PC-based Forest & Trees.

Users of the system define critical success factors or vital signs and set up their applications accordingly. While the $495 product is not a bad step toward eventual EIS functionality, there are a few drawbacks. For one, it is necessary to hard-wire the data to the application as well as program every part of the screen that will be activated. Channel Computing claims that executives can do their own screen modification, but the number of steps involved in this process makes that claim doubtful.

As users choose between large- or small-scale systems, they also are faced with another issue: the degree to which ESS and DSS characteristics should creep into their EIS.

Executive support systems are umbrella systems that enable the executive to communicate with others via E-mail, review people's schedules to set meetings, make travel arrangements and perform other administrative and support functions.

The EIS is the core piece of the ESS that provides the financial, marketing, operational, personnel and competitive information.

The more comfortable the executive is with using a computer, the more ESS functions he'll want in the EIS. For example, on some systems, E-mail is embedded within the EIS application so that the executive doesn't have to go to a separate screen to mail a message about a particular report.

A DSS, on the other hand, is usually targeted at managers and analysts. Whereas an EIS is a presentation vehicle of summary information, a DSS is an analytical tool. EISs do perform some analytical functions, such as sorting, basic mathematics, selection and limited what-if, but DSSs add more sophistication to the picture, performing strategic planning, budgeting and forecasting, consolidated reporting, what-if analysis, goal-setting and optimization on larger volumes of data.

EIS of use

An EIS is also more user-friendly than a DSS. Most vendor packages include a touch screen, mouse or remote control to activate the system. With a DSS vendor package, the user either types in commands or uses function keys to activate the system.

EIS purists hold that executives want only capsulized information and no analytical capabilities. "An executive will take a large report and scan for items that are interesting to him," says Wayne C. Burkan, president of Alternative Visions, Inc., an EIS consulting organization in Farmington Hills, Mich.

"An analyst is far more methodical in

Continued on page 84

Does 'E' stand for 'everybody'?

The "E" in EIS doesn't just have to mean "executive." Once targeted at the top brass, executive information systems are now marketed to — and used at — other levels of the organization. EIS can mean "everybody's information system" to some and even "enterprise intelligence system" to others.

The question is, how far down in an organization can an EIS be effectively used? And, at what point might decision support technology or other information systems better serve needs?

In the traditional view, EISs give top executives a means of tracking critical success factors. With the new approach, "everybody is sharing information and networking from the same ubiquitous database," says Michael Watson, senior manager at Price Waterhouse's Applied Technology Center, which uses the term "enterprise information network." The enterprise view includes all of the people within the organization from the senior-level executives down to the people responsible for the operational work.

Another advocate of this theory is Pilot Executive Software. "EIS is not about executives. It's about a technology that solves a class of information problems," says David Friend, the company's founder and chairman.

"It's about hypertext data navigation, access to multiple data sources, graphical data displays to aid interpretation, multiple ad hoc views of data and so forth. It's just as applicable at the middle-management level as at the top."

Friend even recommends EIS at the operational level. For instance, a plant manager would look at detailed summaries of plant activity to determine the level of efficiency.

Further down in the organization, however, people's information requirements do change, usually growing too specific for an EIS to handle. Friend concurs that decision support system capabilities need to be used at these lower levels.

In Pilot's product, the issue is tackled by assigning different users of the system different access levels to the database. Chief executive officers may access the top three levels of the database, for example, including salary information. Mid-level management and employees on the operational level would view more applicable levels of the database.

> IF EXECUTIVES looked at the business one way, and the rest of the company another, it would create problems.
>
> KEVIN D. GREEN
> INLAND STEEL

Others take a modified view, believing that EIS was designed for more than the top executives, but it's not for everyone.

"Directing the EIS to the top two levels of management is too narrow," says Richard Crandall, president of Comshare. "An EIS must also be designed to include the people who analyze, process, package and deliver information to decision makers. "On the other hand," he continues, "EIS is not relevant right down to the bottom of the organization. There you will start to compete with other products, such as Microsoft and Lotus, that have diferent functionality than an EIS."

Far reach

People who have used EISs see practical reasons for the filtering-down process. Inland Steel Co. intended from the very beginning for its homegrown EIS to reach beyond top executives, says Kevin D. Green, EIS project manager. "If you had the executives looking at the business using one approach, and the rest of the company is looking at the business using a different approach, it would create problems," he says.

At Inland, 40 people — ranging from the chief operating officer to section managers — use the system, and it is currently being made accessible to analysts. Inland follows Pilot's approach, in which employees at different levels of the organization have access to different parts of the database.

EIS purists argue that the democratization of EISs trivializes the technology and undermines the leadership role of top executives. "The purpose of an EIS is to send signals to the organization as to what is important, to indicate movement toward a new direction and to help executives monitor the progress towards that direction," says Wayne C. Burkan, president of Alternative Visions, Inc.

"The organization will succeed or fail based on the leadership of the executives," he adds.

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Continued from page 83

gathering and analyzing information," he says.

Those who see DSS merging with EIS also expect that lower levels in the organization will use EISs (see story page 83).

The top three vendors have a close affiliation with DSS: Comshare and Execucom started out as DSS vendors and later added EIS products, and Pilot started as an EIS vendor and just last year added a DSS component to its product line.

A fourth vendor that is traditionally strong in DSS, Information Resources, Inc., is beta-testing its EIS product. While companies have used its DSS, Express, to build EISs, the firm has added an EIS tool kit to its PC Express with the intention of easing and speeding the EIS application building process. This kit is scheduled to be released next month and will cost $50,000 along with an additional per-user fee.

In all four cases, the DSS can be added for $150,000 to $200,000. Used in combination with the EIS, these systems work well to consolidate and massage the raw data on internal systems.

Despite these advantages, stacking an EIS on DSS or vice versa does not produce the integration one might desire. For example, to perform more sophisticated DSS applications on data presented in the EIS, flat-file transfers or other preformatting steps are necessary to present the information in a user-friendly format. It would be nice to say that you get what you pay for with EISs. In some senses, this is true; $495 won't buy the functionality of a $50,000 package.

However, high price alone cannot guarantee a successful system. There are many implementation concerns that will influence your eventual failure or success [CW, June 25].

The good news is that as the EIS definition changes and blurs, there are that many more types of EIS packages on the market, and companies can choose between luxury and economy models. •

Varying views

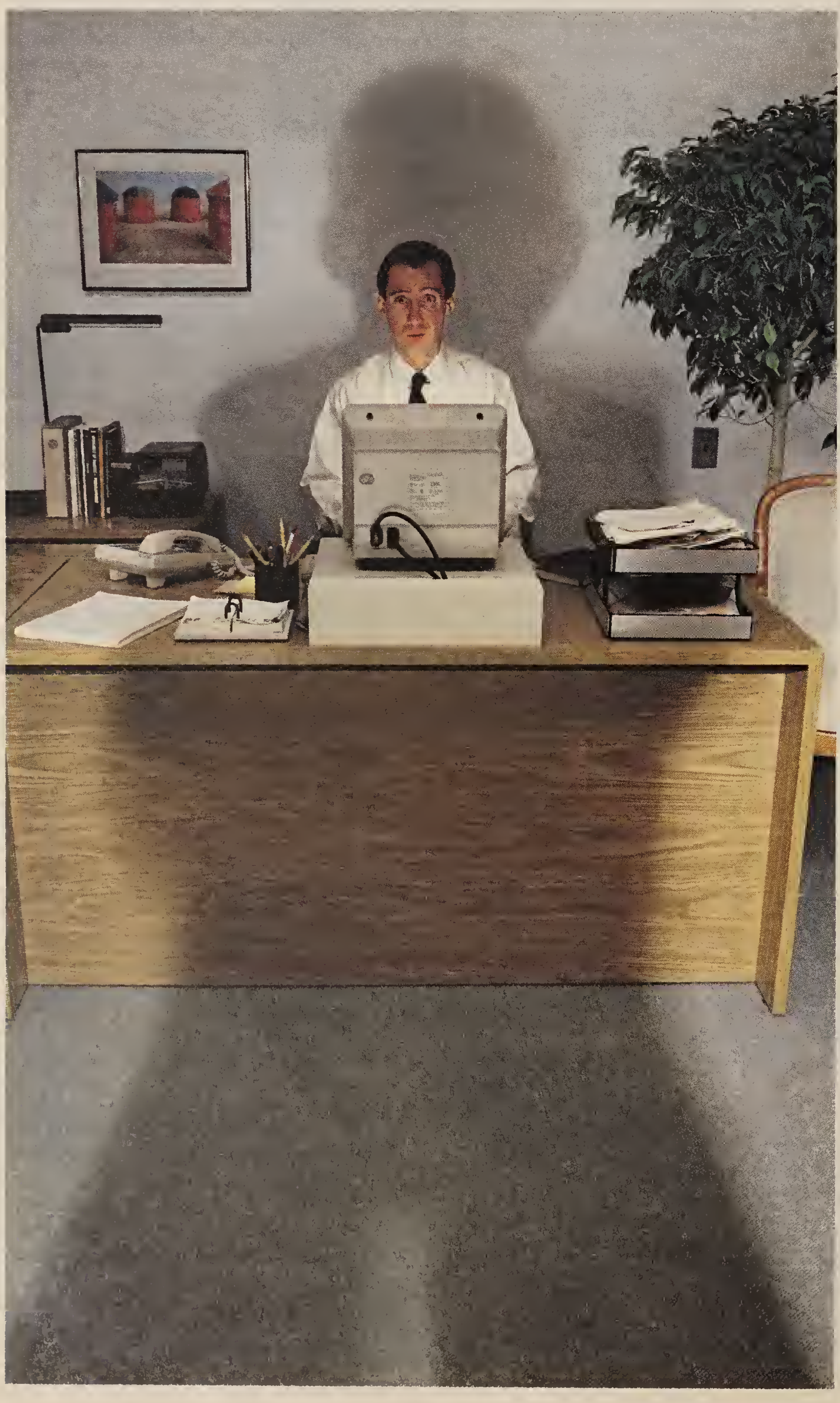
There are as many ways to view data through an EIS as there are ways to view the organization. The most common applications include the following:

- **Financial.** The executive may monitor profitability, analyze expenses or look at the breakdown of revenue — whether by region, corporate division, department or product.
- **Marketing.** The system may display market share, demographic makeup of the customer base and product popularity in various geographic regions.
- **Operational.** The executive may view productivity variation across a number of plants, how the actual production rate compares with the plan and how a strike would affect productivity.
- **Human resources.** May include executive succession planning, number of employees that fit into certain categories according to their skills and experience, actual head count vs. planned head count and background information on individual employees.
- **Competitive.** May include news stories regarding the competitors' financial performance and product mix.
- **External factors.** Execs may want on-line access to interest rates, government regulations, indicators of the general economy and industry trends.

Any of these applications can also be viewed simultaneously; for instance, executives can look at head count vs. financial performance or internal vs. external factors.

EILEEN CARLSON

The Mistakes You Thought You Could Never Make Are The Ones That Come Back To Haunt You.



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Execs say, it's nice, but . . .

BY ALAN RADDING

Top executives may not know every technical detail of how their executive information system (EIS) works, but once they use one, they're pretty sure what they want to do with it.

While a number of executives contacted by *Computerworld* said they were generally pleased with their systems, most could see room for improvement. Displeasure arose mostly when the EIS promised more than it delivered.

> "WE CAN'T use the EIS from a laptop, but that's something I want."
>
> THOM FARIA
> THE NEW ENGLAND

The improvements most wished for varied widely, depending on the executive's usual work habits.

"What I want from an EIS most executives probably don't need," says John Betak, assistant vice-president of asset development at Conrail in Philadelphia, who puts great value on analytical capabilities. On his wish list is specialized software to help analyze the data provided by the EIS.

Matters of taste

The need for analysis tools ranges from the basic to the very sophisticated. Thom Faria, vice-president of agency operations at The New England, a financial services company, for instance, says he would be satisfied with basic modeling capabilities such as what-if scenarios on his EIS from Comshare, Inc.

Sophisticated graphing is in demand at Connecticut Mutual Life Insurance Co. in Hartford, Conn. "Sometimes I'm working with numbers that are in the millions of dollars and numbers that are below half-a-million dollars at the same time," says Richard McGeary, chief financial officer for information systems at the firm. "I need to have logarithmic graphing so I can show orders of magnitude."

Predictive capabilities are gold to some, but they're worthless to others.

"We built our system on the concept of what's happening, not what-if," says Robert Wallace, recently retired president of Phillips 66 in Bartlesville, Okla., a pioneer in EIS. Of more importance is up-to-the-minute accuracy of data.

Other executives just can't get enough information. Conrail's Betak, an experienced computer user who is accustomed to accessing many Conrail databases, says he would like to meld all of these databases into the EIS.

Wallace would like to have more types of data in the EIS, such as information on laws and regulations from legislature and trade associations. To handle this load, he says, the EIS needs to be faster, at least operating "in a speed frame consistent with our mental process."

At Comdisco, Inc., an equipment leasing firm in Rosemont, Ill., James Stanton, vice-president of administration, has access to a massive amount of information through his EIS — the equivalent of 175,000 reports internally plus external data sources. He wouldn't refuse if he were offered more: "If we had better capability to drill down for more detail and if it were easier to get data from outside sources, I'd support that," he says.

The need for detail is echoed by Steve Bonville, second vice-president of individual disability marketing at Unum Life Insurance Co. in Portland, Maine. "I have charts and graphs, but I can't get at the raw numbers," he says. A new version of his Pilot Executive Software EIS promises to remedy that situation.

Other executives seek the comforts of home. "We can't use the EIS from a laptop, but that's something I would very much want," The New England's Faria says. The problem, suggests Connecticut Mutual's McGeary, is the sheer volume of information that would have to be transmitted.

Others chafe at predefined reports and long for unstructured output capabilities. "I wish I could dump [the information from the EIS] on a floppy and move to the desktop publisher or just transfer it to the publisher," Betak says.

Promises to keep

Real dissatisfaction with an EIS arises when it doesn't live up to its billing. At Metropolitan Life Insurance Co. in New York, the problem is not with the EIS but with the incomplete or out-of-date information it delivers.

"They gave me a PC and told me I would have access to a lot of information with a mouse," says Ted Athanassiades, executive vice-president at the firm. "Unfortunately, they aren't keeping up the databases, so it is useless to me."

The screen gives him a colorful display of the information he can select with the click of a mouse, but when he requests that information, he is disappointed. "If I try to access, say, human resources, they give me a report that's dated December 1989. It's useless to me," Athanassiades says.

The company is planning to connect the EIS to the central databases so files can be accessed immediately.

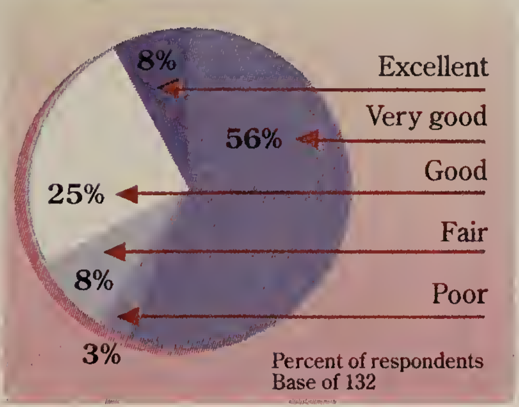
> "I'D LOVE to be able to say 'sales' and see sales information open up."
>
> RICHARD MCGEARY
> CONNECTICUT MUTUAL

Those who are pleased with their current systems see almost limitless potential for enhancements, including expert systems capabilities. "I would love to have the system become intelligent to who you are and what you like to see through your touch stroke," McGeary says. "I'd also love to be able to say 'sales' and see sales information open up."

Others, such as Comdisco's Stanton, think the current technology could use a few improvements. Stanton's particular peeve is touch-screen design. "At times the lines are too close together for thick fingers," he says. •

Great reviews

End users and IS managers dissatisfied with their EISs make up a distinct minority, according to a survey



Source: Pizzano & Co.   CW Chart: Doreen Dahle

Radding is a free-lance writer in Newton, Mass.

ASK THE VENDOR

I'm using Decision Pad from Apian Software on my personal computer to evaluate project alternatives and would like to use some data in my minicomputer database. Is there a way to get the information directly into Decision Pad?

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Manager, SP-100 Nuclear Sub
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Government by screens and keyboards

BY CARYL HOLLAND

FIRST PERSON

It is 30 minutes before the start of a session at the Michigan State Senate. Senators have just enough time to make status checks on their executive information systems (EIS), which were built in-house and implemented earlier this year.

By pressing "daily calendar," they familiarize themselves with the events of the day. They may also check electronic mail messages by using the EIS menu to log on to the office file server.

One senator receives a message from a legislative aide who wants him to review a document pertaining to a bill he is speaking on later today. The senator can retrieve the document located in the shared directory on the file server, make some editing corrections and print the document in the partisan lounge.

A few minutes before the session, the senators check which bills have been referred to the committee by pressing the appropriate button on the screen. While members review the information, the session is called to order, and roll call begins. The screens on the senators' personal computers automatically change to allow them to press the "Aye" button. They then press the "Party" button to view who is present by party.

The Senate is now in full swing, ready to tackle another day of business.

The impetus to build an EIS at the Michigan Senate originated in late 1988, when plans were being finalized to completely gut Senate Chambers and restore the original 1800s decor.

The renovation would result in a complete overhaul, so a few senators who already used PCs suggested incorporating a Chamber computer system into the plans.

"Word processing and database applications were common tools being used to manage the work load," says Senator Bill Sederburg, chairman of the Michigan Capitol Committee. "We realized that computers could help them get the job done on the floor."

The senators were also interested in easy access to Michigan Compiled Laws and legislation under consideration.

Done deed

A little more than a year and $800,000 later ($495,000 in application development and implementation and $322,000 on workstations and network hardware), 34 of the 38 senators are using an EIS in their everyday work and during legislative sessions.

We decided that EIS was the way to go after determining critical success factors for the senators through a series of interviews. Aiding in our study was WW Computer Systems Group in Grand Rapids, Mich.

Bill Snow, the secretary of the Senate, was called on to serve as executive sponsor for the project, and he asked Senate Information Services, the Senate's computer group, to assist in developing a plan.

As our knowledge of EIS grew, we realized how easily one could fail. In order for this project to be successful, we decided to define requirements, document basic assumptions and determine issues that needed to be addressed.

One very basic requirement was that the project had to be completed by Jan. 10, 1990, for the grand opening of the Chamber. Second, we needed to take into consideration the varying degrees of computer skills among the senators: Only 11 of the 38 were computer literate. Third, the computer technology could not intrude on the 1800s decor.

We evaluated some off-the-shelf EIS software but ran into complications. For one, the system had to be compatible with Novell, Inc.'s Netware, which the Senate had chosen as the basis for its computer network. At the time of our implementation, EIS vendors focused primarily on the mainframe environment.

In addition, we could not find prepackaged software that met the operational requirements of the Senate voting system, such as recording votes and requesting to speak on an issue. All of these functions needed to be performed in real time between workstations and the display boards located on the front wall of the gallery.

Given the inability of commercial products to deal with these special requirements, we decided to design and code a system ourselves.

Between April and June, the information systems department worked with Decision Resources Corp., a consulting

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Holland is an implementation manager in the Senate Information Services department in the Michigan State Senate.

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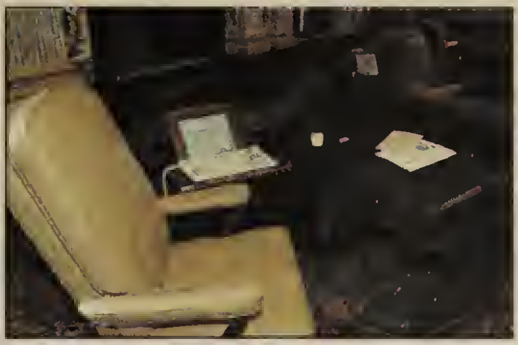
ALLINK integrates information from your existing network element managers. So you can make better network management decisions. While preserving your investment in existing systems. This major breakthrough is now available through NYNEX Information Solutions Group.

This application heralds the introduction of a new concept in network management called the NYNEX ALLINK Network Management Solution. It will become a seamless, integrated network

firm in Washington, D.C., and Daktronics, Inc., a major provider of voting display systems, to design system specifications. With working prototypes, we gathered user feedback on screen layout and functionality. This also helped build support for the EIS because the members took ownership of the system.

During this time, we also evaluated which PC to use. While the Apple Macintosh was the strongest candidate because of its easy-to-use interface, it was not yet fully integrated with token-ring Netware local-area networks.

We ended up selecting IBM Personal System/2 Model 70s running Microsoft Corp.'s Windows/386 software as a graphical user interface. This also allowed senators to switch between multiple applications. For touch-screen capability, we selected Micro Touch System, Inc.'s products and used Atlantic Digital to develop an IBM Micro Channel Architecture graphics controller card.


Michigan senators *have text of amendments at their fingertips*

When we implemented the EIS in January, we were the first legislative body to incorporate full-functioning workstations at the senators' desks. Not only that, but the workstations are incorporated into roll-top desks, thus keeping with the Chamber's decor.

We are very pleased with the acceptance of the EIS. "This technology has improved efficiency of senators, allowing them to monitor inter- and intra-office communications. Plus, they have the text of amendments at their fingertips," says Senator John Engler, Senate Majority Leader and a strong advocate of computer technology. As for the future, we are just beginning to discuss such possibilities as access to on-line news services, graphical presentations of fiscal analyses and audiovisual capabilities. •

ASK THE VENDOR

I've used SPSS's Statistical Data Analysis System for decision-making and to produce ad hoc reports. Are you planning on adding more of these types of features?

Richard Tamberrino
Director of Research and Statistics
Maryland Department of Public Safety and Correctional Services
Baltimore, Md.

SPSS, INC.: While no date is yet set for the release, we are planning to add customizable report features, such as utilities for incorporating supporting graphs and text into reports and merging SDAS output with that of other software, such as word processing packages.

How can I express "unquantifiable" elements in terms that Expert Choice's decision support system can understand?

Ern Reynolds
Attorney
Ern Reynolds Professional Corp.
Falls Church, Va.

EXPERT CHOICE, INC.: Suppose you're trying to decide whether to market Product A, B or C and you're concerned with a few different variables, such as making a profit, maintaining the company's image and increasing market share.

First, state the goal: choosing the best product to market. Next, plug in the criteria: profit, company image, market share. Then, enter the products: A, B, C.

Expert Choice will take you through a series of judgments about the relative importance of pairs of criteria. You would then make judgments based on your experience, intuition and knowledge of the company's culture. These judgments can be expressed either on a numerical scale, ranking one to 10, or on a verbal scale, using the words "equal," "moderate," "strong," "very strong" or "extreme."

You would then make a series of judgments about the products in terms of how well they satisfy each criterion.

In making judgments about price and profits — both quantifiable elements — you may use primarily hard data, such as figures provided by the production and engineering departments. In making judgments about preference of said product in terms of company image, you are likely to rely on personal experience and intuition, perhaps mixed with the results from a marketing survey.

Expert Choice synthesizes the results of all the judgments — whether or not they're based on tangibles or intangibles — and arrives at a choice that incorporates your expertise and knowledge as well as quantifiable data.

link is discovered

management system, streamlining everything from operations to administration, performance and design.

If your company is digging around for a new and innovative solution, the NYNEX family of companies would like to help. We offer you everything from communications and computer systems, to professional services, to advanced software and systems and network integration. Call us at 1 800 535-1535 and get a closer look at what's been missing from connectivity.

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BUYERS' SCORECARD

Command Center slips past Commander *(barely)*

BY MICHAEL L. SULLIVAN-TRAINOR
CW STAFF

Coke or Pepsi, Burger King or McDonald's, Ford or GM — which do you prefer? If you find those choices hard, then you begin to understand the difficulty information systems professionals face in choosing between executive information systems (EIS) rivals Comshare, Inc. and Pilot Executive Software.

While Comshare's Commander owns an imposing 55% of the installed base, as opposed to Pilot Command Center's 34%, the two are nearly equal in the types and qualities of features they offer, according to *Computerworld's* Buyers' Scorecard survey of 50 users of each product.

Introduced in the early 1980s, Pilot's EIS products lost an early lead in share to Comshare, which introduced Commander in 1985. These were followed in October 1988 by Execucom Systems Corp.'s Executive Edge, which has 5.7% of the installed base (See Executive Edge ratings and methodology page 89).

The closeness of Pilot's and Comshare's packages is reflected in a whisker-thin difference in the overall ratings. Command Center edged ahead with 58.1 points to Commander's 57.9. The point totals are derived from multiplying the ratings each user group gave his own product by the importance factors all users assigned to the 17 criteria.

Despite the closeness in overall scores, the two packages do have different approaches in key areas. For example, Command Center is a host-based product, with data downloaded to personal computers on request. Commander, on the other hand, uses host-based data but requires all screens to be downloaded to the PC.

Another feature that wins user points for Command Center is an automatic program generator that supports screen design and maintenance. The product received its highest rating — 8.8 out of a possible 10 — in the area of screen design, which is one of the most key considerations for users. Screen design was rated 8.7 in importance by all users on a one to 10 scale. Command Center also topped other application development categories.

Commander scored higher, however, in data access and integration categories. The package comes with specific links to different types of internal databases. This feature was reflected in a rating of 7.5 for data extraction from existing databases. In addition, Comshare was the first to forge relationships with other vendors that offer external database services. Users recognized these ties with a 7.5 rating for access to external databases.

The strength of Commander's System W decision support system was reflected in a score of 7.7 for well-integrated decision support.

COMPUTERWORLD BUYERS' SCORECARD

Full capability executive information systems

Total scores reflect all criteria and their user-assigned importance. Response base: 50 users per product

Product	First place finishes Top five:	Second place finishes Bottom five:
Pilot's Command Center SCORE 58.1	Integrating data from different sources Ease of screen design and maintenance Quality of service and technical support Ease of customization Interfaces to other software, such as Profs & Lotus 1-2-3	Presenting graphics, text and tables on the same screen Data extraction from existing databases Support for rapid prototyping Support for multiple interfaces Security for data, screens and systems
Comshare's Commander SCORE 57.9	Presenting graphics, text and tables on the same screen Data extraction from existing databases Support for rapid prototyping Support for multiple interfaces Security for data, screens and systems	Integrating data from different sources Ease of screen design and maintenance Quality of service and technical support Ease of customization Interfaces to other software, such as Profs & Lotus 1-2-3

USER RATINGS

Each product shows its strengths in user ratings of EIS capabilities. Commander wins by a considerable margin in three of the five data access categories and takes a fourth by a hair. Command Center has a slight edge in integration, price and user features and excels in several ratings related to ease of use.

Data access

User importance rating:		Command Center	Commander
8.7	Integrating data from different sources	7.9	7.8
8.4	Efficient data extraction from existing databases	6.4	7.5
8.0	Efficient access to external databases	6.3	7.5
7.5	Multilevel, ad hoc query capability	7.2	7.3
7.1	Well-integrated decision support system	6.2	7.7

Application development

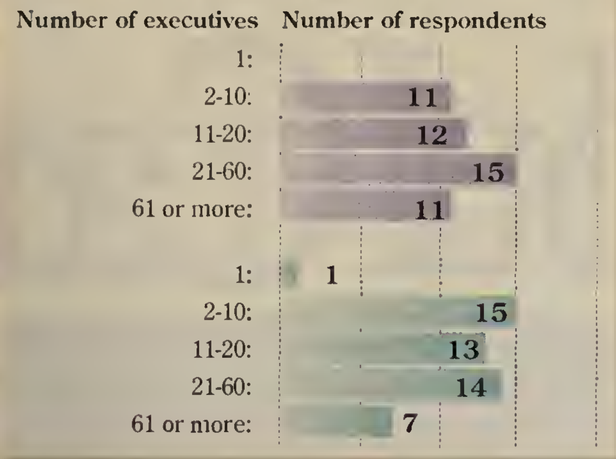
User importance rating:		Command Center	Commander
8.7	Ease of screen design and maintenance	8.8	7.5
8.4	Ease of customization	7.9	7.5
8.3	Support for rapid prototyping	8.1	8.1
8.0	Effective support for multiple user interfaces	7.4	7.4
7.8	Good security for data, screens and systems	6.8	7.6
7.4	Varied application shells	7.7	7.0

User features

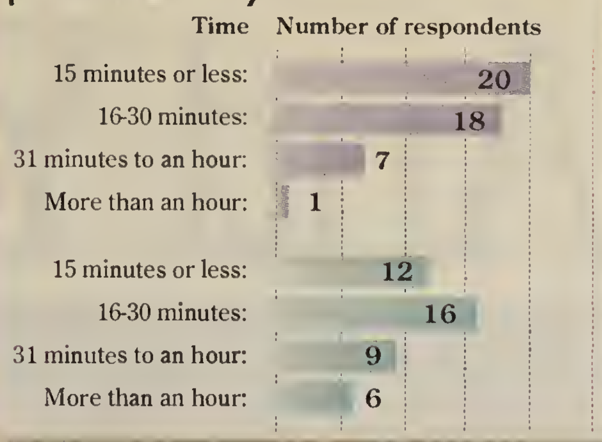
User importance rating:		Command Center	Commander
8.9	Well-presented graphics, text, tables on screen	8.5	8.6
8.5	Quality of service and technical support	7.4	7.3
7.9	Effective interfaces to software such as Profs & Lotus 1-2-3	7.5	7.0
7.2	Pricing of installation & maintenance	6.7	5.7
7.2	Easy to create hard copy output	7.2	6.4
6.5	Useful on-line Help screens	6.3	6.1

A CLOSER LOOK

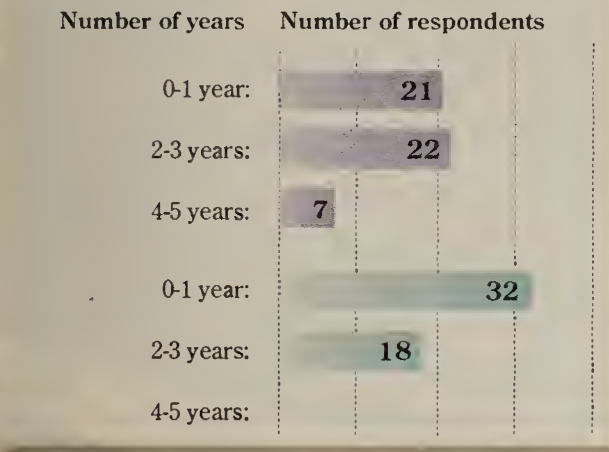
How many executives use these products?



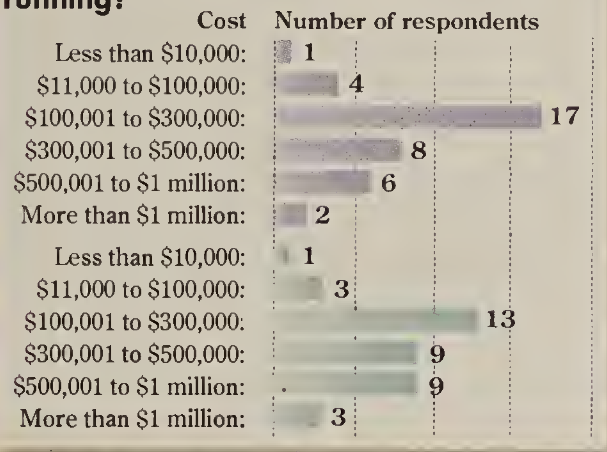
How much do the executives use these products each day?



How long has the package been in use?



How much did it cost to get the EIS up and running?



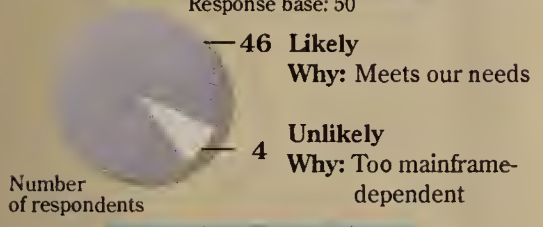
Loyalties

Would you buy the product again?

(Reasons based on most frequently stated responses)

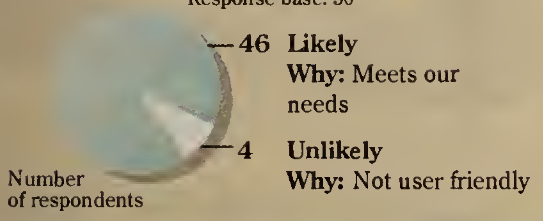
Command Center

Response base: 50



Commander

Response base: 50



“ Verbatim ”

Responses are based on the most frequently stated answer to:

“What do you like best/least about this product?”

(Response base: 50 per product)

Command Center

Likes	Dislikes
“Ease of use”	“Weak external database access”
“Ability to customize”	“Inability to create ad hoc PC files”
“Graphics”	“Poor technical support ”

Commander

Likes	Dislikes
“Graphical user interface”	“Maintenance”
“Ease of use”	“Briefing book capabilities”
“Prototyping capability”	“Not user friendly”

First in pursuit

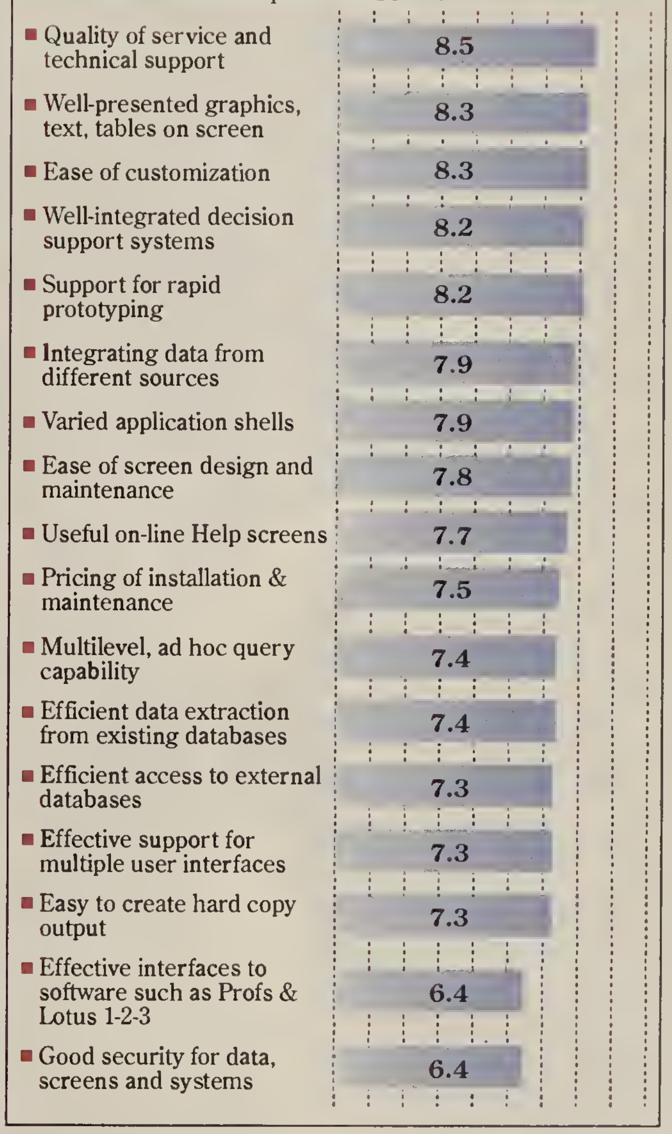
Execucom Systems Corp.’s Executive Edge owns third place in the EIS battle for installed base. About 50 companies are now using the product, which was introduced in October 1988. Many of these were already users of Execucom’s IFPS/Plus decision support system (DSS).

Execucom is one of a group of vendors pursuing pioneers Comshare and Pilot. Other competitors include Information Resources, Inc., with its fairly new EIS based on its Express DSS, and IBM’s Executive Decision. Express EIS is in beta testing with about 12 users, and IBM’s product was just released last September.

The Buyers’ Scorecard ratings from 20 Executive Edge users reflect the company’s strong tradition of service and support. That was the category in which the product received its highest score. The product features an “explain” function that automates the traditional drill-down process. This expert system-based function did not seem to influence survey users, who assigned a fairly low grade for multilevel, ad hoc query capability.

EXECUTIVE EDGE RATINGS

Response base: 20



METHODOLOGY

Products rated in *Computerworld’s* Executive Information Systems Buyers’ Scorecard were chosen based on the following criteria:

Products selected for review by users had to be full-capability EIS, which means they had to be designed for use by top-level management and offer the following functions: drill down; exception reporting; data extraction from existing databases; access to external databases; support for multiple-user interfaces; on-line context-dependent Help screens; command files; multiple methods for locating information; integrated decision support; screen design templates; application shells; graphics, tables and data on the same screen; hard copy output; and integration with office software.

The products also had to be one of the share leaders in both installed base and revenue. For example, Comshare leads the pack with 55% of the installations, followed by Pilot and Thorn EMI, which both sell Command Center and have a combined share of 34%. The firm with the third-largest base of users, Execucom, has 5.7% of the market.

Because of the large market share difference and a consequent difference in the number of users available to be surveyed, the user ratings for Execucom’s Executive Edge are presented separately from those of Commander and Command Center. While Commander and Command Center are installed in more than 200 sites per product, Executive Edge is installed in only about 50 sites. While respondent populations of 50 per product were used for the Commander and Command Center ratings, a population of 20 respondents was used for Executive Edge. In addition, less than one-third of the Commander and Command Center respondents were supplied by the vendors, while more than 80% of the Executive Edge respondents were supplied by the vendor.

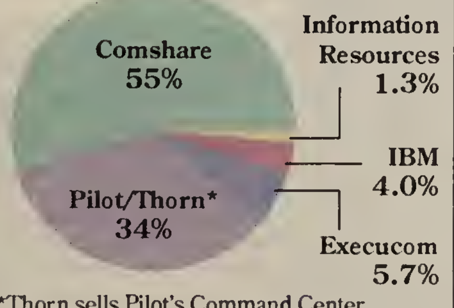
The ratings were based on telephone surveys conducted by First Market Research in Austin, Texas. Result tabulation was performed by IDG Research Services in Framingham, Mass.

The total scores, which are weighted according to the criteria that all the respondents find most important, are computed by multiplying the mean scores all users assigned to the importance of each criteria by the mean scores each user group gave to its own product.

For example, the criteria — ease of screen design and maintenance — received a mean importance rating of 8.7 on a scale of one to 10. Command Center users gave their product a rating of 8.8 for performance in this criteria. To develop a total score, these two factors are multiplied for a total of 76.56. This total is then added to the other totals of criteria importance ratings and performance ratings. This sum is divided by the total number of ratings for a total score for all 17 criteria.

Vendor shares of worldwide host-based EIS installations

As of 1989



*Thorn sells Pilot’s Command Center

Source: International Data Corp.

ACKNOWLEDGMENTS

CW acknowledges the assistance provided by the following individuals and organizations in the preparation of this month’s Buyers’ Scorecard: Michael Bragen, Business Management Consulting; Cliff Conneighton, Gartner Group, Inc.; Christina Filistowicz, Dataquest, Inc.; Clare Gillan, International Data Corp.; Peggy Kilburn, The EIS Institute; Alan Paller, EIS Conference Report; Hugh Watson, University of Georgia; Stuart Woodring, Forrester Research, Inc.; Computer Intelligence Corp.; and Installed Technology International.

As Fast As
And You Can

NCR
Paint - GRAPH.PX
Clock
7:00 AM Breakfast with Ed, Desktop Pub, pro
8:00 Submit report to Exec Office
9:00 Prepare for departmental meeting
10:00 Review marketing plan with Mark
11:00
12:00 PM Working lunch with Heiden Group
1:00
2:00
3:00
NCR
PC486/MC

It Gets.
Get It Fast.

The NCR PC486/MC is one fast machine. *PC/Computing* reports "the PC486/MC is on the front edge" of 486 desktops.* With its dual high-speed cache design, the system takes full advantage of the performance potential of the i486™ microprocessor. And its implementation of Micro Channel™ architecture makes it the clear leader in providing full 32-bit performance.

According to *BYTE* Lab benchmarks, the PC486/MC's "mass storage subsystem (with a 100MB SCSI hard drive) turned in the fastest performance we've ever measured."*

Standard Features

i486 Native Design
•
Micro Channel Architecture
•
128KB Of High-Speed Cache Memory
•
SuperVGA Display Adapter
•
Small Computer System Interface (SCSI) Multi-Peripheral Controller
•
Worldwide Service and Support
•
Available *Now*

Our PC is the only native design 486 Micro Channel machine from a major vendor now available. We've not only released it for sale, we're delivering it in volume. The competition will eventually release a native-design 486. But how long will it be before they can deliver?

The PC486/MC is ideal for MIPS-hungry applications like large spreadsheets, financial modeling, simulations, CAD, and networking.

It's the first of a family of advanced PCs that will lead the market in speed, power, and availability.

Our PC family also includes high-performing 286™ and 386™-based PCs. Backed by the resources of a $6 billion computer company with service and support in nearly every country in the world. And a commitment to quality that is unequaled.

Call 1 800 544-3333 for a free six-page 486 PC comparison brochure. We'll also put you in touch with the NCR or Businessland representative, or other Authorized NCR Reseller nearest you.

NCR

Open, Cooperative Computing.
The Strategy For Managing Change.

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EIS packages

VENDOR	PRODUCT	HARDWARE PLATFORM	OPERATING SYSTEM	DISK SPACE NECESSARY TO LOAD PROGRAM (BYTES)	GRAPHICS CAPABILITIES	IMPORTS GRAPHICS FROM EXTERNAL SOURCES	OFFICE AUTOMATION TOOLS INTERFACED WITH	REPORT GENERATION (STATIC OR AD HOC)	UPDATE PROCEDURE (AUTOMATIC OR MANUAL)	AUTOMATED APPLICATION DEVELOPMENT	NETWORKS SUPPORTED	WINDOWING FACILITY SUPPORTED	EXTERNAL ON-LINE SERVICES ACCESSED	USER INTERFACES AVAILABLE	OTHER FEATURES	PRICE
Ashton-Tate Corp. **(213) 329-8000**	Framework III	IBM PC AT, XT, PS/2 and compatibles	DOS, OS/2	3M	Bar, line, pie, scatter, stacked bar, XY	No	Communications, databases, E-mail, spreadsheets, word processing	Both	Automatic	Yes	3Com, AT&T Stargroup, Banyan, IBM PC LAN, Novell Netware	Proprietary	Dow Jones News/Retrieval, Compuserve, Ashton-Tate BBS, others on request	Keyboard, mouse	Outlining capability	$695
Channel Computing, Inc. **(800) 289-0053**	Forest & Trees	IBM PC AT, XT, PS/2 and compatibles	DOS 3.1 and higher	750K	Bar, line, pie, XY	No	Databases, spreadsheets	Both	Automatic	Yes	Any PC-based, Token-Ring	None	None	Keyboard, mouse	None	$495
Cogent Information Systems, Inc. **(201) 795-4003**	EIS/Corporate Performance Analysis	Any minicomputers that support operating systems listed at right	Unix, Unidata, Universe, Prime Information, Pick	28M	Bar, line, pie, XY, others from external graphics packages	Yes	Databases, E-mail, spreadsheets, word processing	Ad boc	Either	No	Primenet	None	Dow Jones News/Retrieval, Mead Data Central, Reuters, UPI, AP	Keyboard	Built in on request	$35,000 +
Comshare, Inc. **(800) 922-7979**	Commander EIS	DEC VAX 3000, 6000 and 8000 series, IBM PC and compatibles, IBM 9370 series, PS/2, Apple Macintosh	VM, MVS, VMS, DOS, OS/2, Apple Macintosb OS	10M for PC, 40M-100M for host	3-D, bar, line, pie	Yes	Communications, databases, E-mail, spreadsheets, word processing	Both	Automatic	Yes	3Com, Banyan, Decnet, SNA, Novell Netware, Token-Ring	OS/2, Apple Macintosh Multifinder, proprietary	Dow Jones News/Retrieval, Infoglobe	Mouse, toucb screen; keyboard optional with DOS machines	CD-ROM support, imaging capabilities, large screen display, on-line tickler file, voice annotation	$48,000
Decision Technologies, Inc. **(203) 327-4000**	Probus EIS	Apple Macintosh	Apple Macintosb OS	500K	Bar, line, pie	Yes	Communications, databases, E-mail, spreadsheets, word processing	Static	Automatic	Yes	3Com, Appletalk, Novell Netware, other AFP-compatible networks	Apple Macintosh Multifinder	Dow Jones News/Retrieval	Keyboard, mouse	CD-ROM support, imaging capabilities, large screen display, video, voice annotation	$45,000 for site license
Dialogue, Inc. **(212) 425-2665**	Access Executive	IBM 370 series, DEC VAX, Unix machines, IBM PC	CMS, TSO, VMS, Unix, DOS	8M	3-D, bar, line, pie, text, XY	No	Communications, databases, spreadsheets, word processing	Both	Automatic	Yes	DEC PCSA, Novell Netware	None	No direct support, but interfaces written on request	Keyboard, mouse	None	$1,000-$200,000
Dun & Bradstreet Software **(404) 239-2000**	Smartview	IBM 370 series, IBM PC, PS/2 and compatibles	MVS, DOS 3.1 and higher, OS/2	6M for PC, 300 cylinders for bost	3-D, bar, line, pie, XY	No	Communications, databases, E-mail, spreadsheets, word processing	Both	Either	Yes	Novell Netware, IBM PC LAN	Microsoft Windows 3.0	None	Keyboard, mouse, track ball, touch screen	Large screen display, on-line calendar	$50,000
Execucom Systems Corp. **(800) 531-5038**	Executive Edge	Any machines that support operating systems listed at right	MVS, VM, AIX, SCO-Unix, VMS, Micro VMS, Ultrix, RISC Ultrix, MPE-XL, HP-UX, Dynix, DOS 3.3 and higher, Apple Macintosh OS	360K-720K for workstation, 20M for host	Area, bar, high-low-close, line, pie, variance, XY	Yes	Communications, databases, E-mail, spreadsheets, word processing	Both	Either	Yes	Any PC-based network	Microsoft Windows, proprietary	Dow Jones News/Retrieval, others on request	Keyboard, mouse, remote control	On-line calendar, scheduling template, CASE-style application generator with object-oriented capabilities, icon library	$50,000-$300,000
Ferox Microsystems, Inc. **(703) 684-1660**	Encore EIS Toolkit	IBM PC AT and compatibles	DOS	20M	Bar, line, pie	Yes	Communications, databases, E-mail, spreadsheets, word processing	Ad hoc	Both	No	Novell, Imaginet, Token-Ring	None	None	Keyboard, mouse	None	$3,000
Global Software, Inc. **(800) 326-3444**	Global EIS	IBM PS/2 and compatibles	DOS 3.0 and 4.0, OS/2	3M	3-D, bar, high-low-close, line, pie, scatter, XY	No	Communications, spreadsheets, others built in on request	Ad hoc	Either	No	3Com, IBM PC LAN, Novell Netware, others on request	OS/2 Presentation Manager	Dow Jones News/Retrieval, Compuserve, others on request	Keyboard, mouse, touch screen	Large screen display	$75,000-$100,000; annual lease available
IBM **Contact local office**	Executive Decisions	IBM 370 series, PS/2	VM, MVS, OS/2 Extended Edition	2M	3-D, bar, line, pie, XY, others from external graphics packages	Yes	Databases, E-mail, spreadsheets, word processing; communications optional	Both	Automatic	No	Any supported by OS/2 Extended Edition Communications Manager	OS/2 Extended Edition Presentation Manager	Dow Jones News/Retrieval, others via service workstation	Keyboard, mouse, touch screen	Automatic telephone dialing, imaging capabilities, large screen display, on-line calendar and address book, stock trends graphing capability, voice annotation	$7,500-$68,400 (host component), $500 per workstation, $100 for optional communications feature
IMRS **(203) 323-6500**	IMRS On Track	Compaq 286, 386 and compatibles, IBM PC AT, PS/2 and compatibles	DOS	1M-2M	Bar, line, pie, XY	Yes	Communications, databases, E-mail, spreadsheets, word processing, Micro Control and Fastar financial packages	Static	Automatic	No	3Com, Ethernet, IBM PC LAN, Netbios, Novell Netware	Microsoft Windows	No direct support but can access any on request	Mouse, touch screen	Large screen display, on-line calendar	$35,000-$50,000, includes five end-user licenses
Information Resources, Inc. **(617) 890-1100**	Express/EIS	Any machines that support operating systems listed at right	MVS, VM, VMS, MPE/XL, Primos, DOS	2M	3-D, area, clustered and stacked bar, line, pie, XY	Yes	Communications, database, E-mail, spreadsheets, word processing	Both	Either	Yes	3Com, bisynch, asynch, Banyan, Ethernet, Novell Netware, Token-Ring, SNA, SDLC	Proprietary	Dow Jones News/Retrieval, Compuserve	Keyboard, mouse, remote control, touch screen	CD-ROM support	$50,000 +

All products perform exception reporting. All have drill-down capabilities except those from Ashton-Tate Corp., Meta Media, Inc. and New Generation Software, Inc.

The companies included in this chart responded to a recent survey conducted by *Computerworld.* When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

VENDOR	PRODUCT	HARDWARE PLATFORM	OPERATING SYSTEM	DISK SPACE NECESSARY TO LOAD PROGRAM (BYTES)	GRAPHICS CAPABILITIES	IMPORTS GRAPHICS FROM EXTERNAL SOURCES	OFFICE AUTOMATION TOOLS INTERFACED WITH	REPORT GENERATION (STATIC OR AD HOC)	UPDATE PROCEDURE (AUTOMATIC OR MANUAL)	AUTOMATED APPLICATION DEVELOPMENT	NETWORKS SUPPORTED	WINDOWING FACILITY SUPPORTED	EXTERNAL ON-LINE SERVICES ACCESSED	USER INTERFACES AVAILABLE	OTHER FEATURES	PRICE
Interactive Images, Inc. (617) 938-8440	Manager's Portfolio	IBM PC, PS/2 and compatibles	DOS, OS/2	2M+	3-D, bar, line, pie, XY	Yes	Communications, databases, E-mail, spreadsheets	Both	Manual	Yes	Any PC network	OS/2 Presentation Manager	Dow Jones News/Retrieval	Keyboard, mouse, touch screen	Imaging capabilities, large screen display, on-line calendar	$7,500+
Interactive Software Services, Inc. (800) 288-8550	AMIS (Advanced Management Information System)	IBM AS/400, System/38	OS/400, CPF	35M	Bar, line, XY	No	Any externally defined file	Ad boc	Automatic	No	None	None	None	Keyboard	Large screen display, multidimensional database	$25,000-$75,000
Manageware, Inc. (203) 359-9397	Compete	IBM PC, AT, PS/2 and compatibles	DOS, OS/2	1M	Dependent on external graphics package	No	Databases, spreadsheets, word processing, ASCII files	Both	Either	Yes	Any that can run under Microsoft Windows	Microsoft Windows 3.0	None	Keyboard, mouse	None	$4,995
Meta Media, Inc. (404) 892-7921	Executive Information System	IBM PC and compatibles with Video Show hardware/software unit	DOS 3.3 and higher	1M	Line	Yes	Communications, databases, E-mail, spreadsheets, word processing	Static	Automatic	No	Any that are PC-based, Netbios-compatible	None	Signal, Reuters	Digi Pad, keyboard, mouse	Imaging capabilities, large screen display	$50,000 licensing fee
Metaphor Computer Systems, IBM (800) 255-5803	IBM Data Interpretation System	IBM PS/2, 386-, 1486-based PCs	DOS, OS/2	200K, plus that required for dedicated file server	Bar, curve, line, pie, XY	No	Databases, E-mail, spreadsheets, word processing	Both	Manual	Yes	Ethernet, Token-Ring	Proprietary	Dow Jones News/Retrieval	Keyboard, mouse	None	$40,000 plus $4,000 per workstation
New Generation Software, Inc. (916) 920-2200	1. Q.	IBM AS/400, System/38	OS/400, CPF	18M	Bar, line, pie, XY	No	Spreadsheets, word processing	Ad hoc	Automatic	No	None	None	None	Keyboard	None	$1,750-$13,500
Pilot Executive Software (617) 350-7035	Command Center EIS	IBM 370 series, DEC VAX, HP 9000, IBM PC XT and compatibles, Apple Macintosh	VM, MVS, VMS, Unix, DOS, Apple Macintosh OS	400K for PC, 20M - 30M for host	3-D, bar, line, pie, scatter, symbol, XY	No	Communications, databases, E-mail, spreadsheets, word processing	Both	Automatic	Yes	Any supporting HLLAP1, EHLLAP1, EEHLLAP1, Ethernet protocols	Apple Macintosh Multifinder, proprietary	Comtex, Dow Jones' Dow Vision, News Net, Reuters, others	Keyboard, mouse, touch screen	4GL, CD-ROM support, large screen display; imaging capabilities and voice annotation on Apple Macintosh	$45,000-$150,000
SAS Institute, Inc. (919) 677-8000	The SAS System	IBM 370, 4300, 9370, 3000 series, PC AT, PS/2, DEC VAX, Data General and Prime minicomputers, Sun and HP workstations	MVS, CMS, VSE, VMS, DOS, ADS/VS, Primos, HP-UX, Sun OS	10M+	3-D, bar, line, pie, XY	No	Communications, databases, spreadsheets, word processing	Both	Either	Yes	Novell Netware, Ethernet, Decnet	OS/2, DEC, X, proprietary	None	Keyboard, mouse	Large screen display, on-line calendar	$595 for PC component, up to $19,000 for host component
Software 2000 (508) 778-2000	Vision 2000	IBM PC and compatibles, AS/400	DOS 3.1 and higher, OS/400	750K	Bar, line, pie	No	Databases, spreadsheets	Ad hoc	Automatic	No	Any PC network	None	None	Keyboard, mouse	None	$15,000, plus $2,500 per five users

Products that already understand the lingo

BY RUDOLPH PIZZANO

Executive information systems (EIS) now come in special-purpose flavors.

Several software developers have recently released packages that cater to particular industries, such as financial services or medical institutions, or to specific business departments, such as human resources and information systems.

In some instances, these packages are really just applications software with a twist — an EIS front end that provides a graphical user interface, drill-down capabilities and exception reporting. In others, they began as specific applications and grew into full-blown EISs that can be used independently of the original software. In both cases, these packages have something to recommend them.

For one thing, tailored EISs can reduce customization time because they are geared to the vocabulary and practices of a particular area and written to gather and present data accordingly. While a hospital administrator tracks "DRGs," a television network programming director may monitor "overnights," and the leveraged buyout specialist who owns both firms watches the yield curve.

These departmental and vertical EISs can also save money. Buying an EIS front end for a departmental application costs approximately $50,000 per application — well under the price range of a general-purpose EIS, which typically costs from $100,000 to $200,000.

A departmental EIS is only cost-effective for one or two applications, however. For three or more departments, it is more economical to purchase a general-purpose EIS and customize the interface to each departmental system.

For vertical-market EISs, prices range from less than $50,000 to $150,000.

To develop EIS capabilities in their systems, applications software vendors either license technology from traditional EIS vendors or go it alone.

All three of the top EIS vendors — Comshare, Pilot Executive Software and Execucom Systems Corp. — are currently licensing their technology to software firms.

> TAILORED EISs can reduce customization time because they are geared to the vocabulary and practices of a particular area.

Pilot has formed a relationship with HBO & Co., a software developer for hospitals in Atlanta. HBO's system keeps track of financial data, which administrators must report to insurance companies or government agencies. It also tracks patient care information, such as drugs administered, hours of physical therapy and surgical procedures. With Pilot's EIS front end, administrators can more easily access both types of data.

Medicus Systems Corp. in Evanston, Ill., another health-care software developer, formed a similar alliance with Comshare, which also offers an EIS tailored for the retail industry.

For its part, Execucom has licensed its front end to Telos Corp., a telecommunications company.

Several software firms have developed EIS capabilities internally, including Legent Corp., Multitrak, Software 2000, Inc. and Information Resources, Inc. (IRI).

Whereas Legent's and Multitrak's EIS offerings are designed to work with their applications software, Software 2000 and IRI are pitting general-purpose systems against offerings from the top three EIS vendors.

Legent, based in Vienna, Va., and Boston-based Multitrak both offer project management software for IS. These systems track the progress on projects as well as capacity planning.

After finding that its clients spent a lot of time pulling together information generated from their system to prepare management presentations, Legent decided to add the EIS function.

Multitrak's original project management software was IBM mainframe-based; when it came out with a personal computer version, it decided to add an EIS front end. Legent and Multitrak each price their systems at less than $50,000.

Software 2000 in Hyannis, Mass., is a vendor of human resources and accounting software that licensed an EIS front end from Forest & Trees, Inc. in Portsmouth, N.H. With this technology, Software 2000 has developed a general-purpose EIS that can work with many other applications packages than its own. Now in beta testing, the product is intended to compete directly against Pilot, Comshare and Execucom with a price point of less than $50,000.

Similarly, IRI in Waltham, Mass., is positioning its Express/EIS against the "big three," although its original data retrieval software was intended for consumer packaging firms. Express/EIS, now in beta testing, is priced at $50,000, plus $2,500 per workstation.

With the popularity of graphical interfaces, exception reporting and drill-down capabilities, this trend of adding these EIS capabilities into systems will most likely continue. •

Pizzano is president of Pizzano & Co., an economic and management consulting firm in Woburn, Mass.

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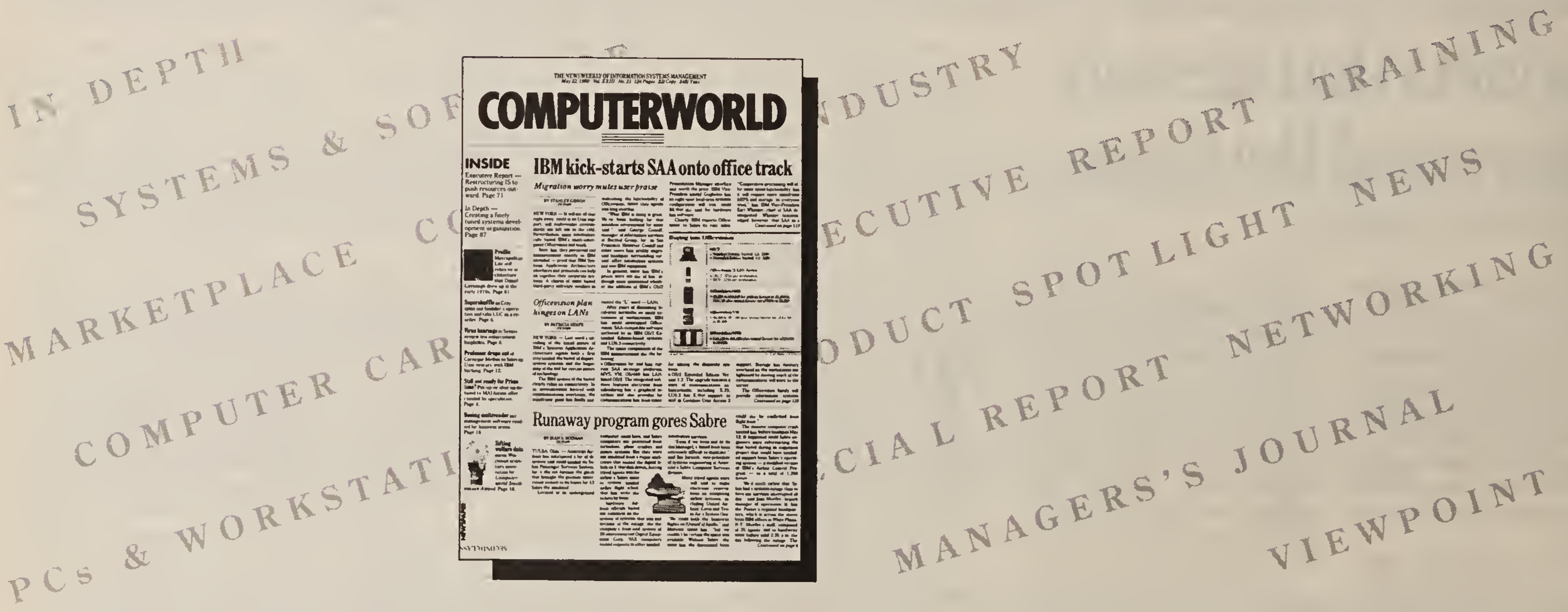
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Software copyright: Two views

United States: 'An orderly unfolding'

BY ANTHONY L. CLAPES

Bullfighting is an activity in which it is required at some point to enter the terrain of the bull. Writing software is not such an activity. Entering the gray area — offering programs that mimic aspects of someone else's program — is an option, not a necessity. Those who do so enter that arena with their eyes open and with the extremists on either side of the intellectual property spectrum shouting at them from the stands to get closer or pull farther back.

The copyright law imposes a set of civilizing rules on competitors in the software *corrida.* Those rules balance the rights of the bull — the innovator — and those of the bullfighter — the follower — so that the barbarism of the traditional bullring does not leak into this large and important area of socioeconomic activity. When the rules of the game are followed, the bull's blood is not drawn and the bullfighter is not gored.

Ideas from an original program, including those reflected in its structure, logic and flow, as well as in its user interface, are made available for free appropriation by the follower. The expression chosen by the innovator remains his exclusive property to exploit, unless it is necessary to the idea or unless the follower serendipitously arrives at the same expression without access to the original. This formula has set humanity's affairs in order for more than 200 years in relation to written expression. No good reason has been advanced for departing from it in the case of computer programs.

The silicon spice that gives life and personality to the computer consists of works of authorship in which the range of expression can be both broad and deep, but that is not always so. Some programs exhibit no great creativity and by their nature cannot do so. For such programs, traditional copyright protection will be as thin as it is for recipe books.

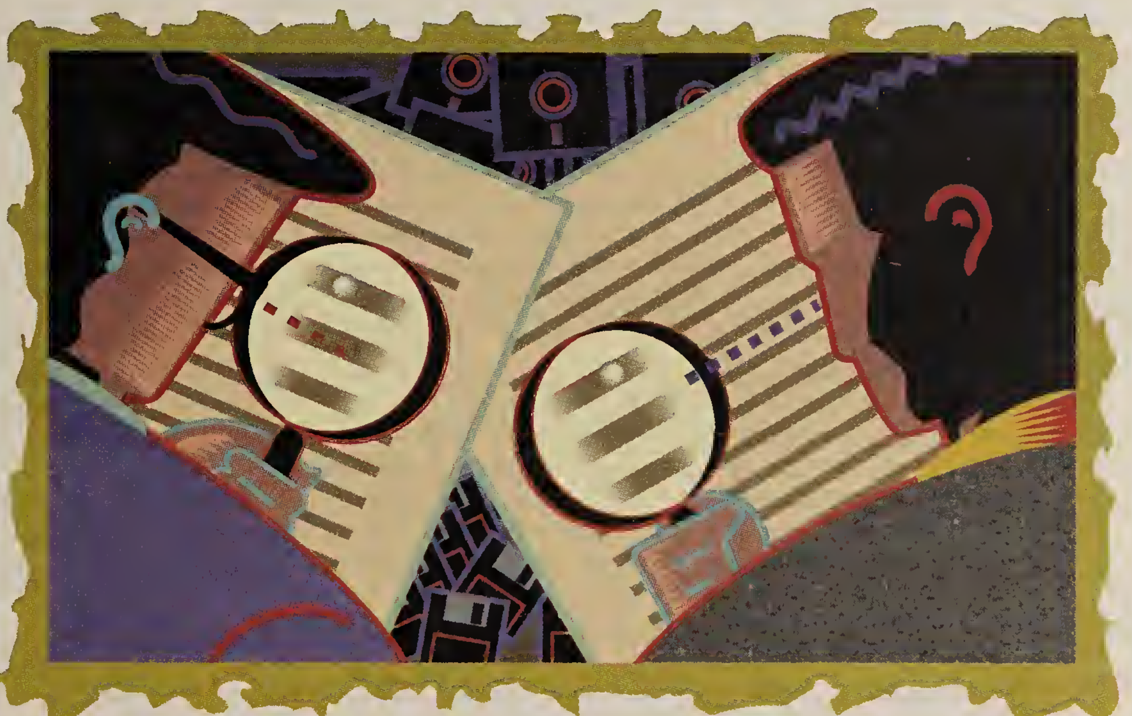
Generally speaking, however, programs of any significant size and complexity are works of authorship that exhibit all the attributes of those imaginative literary works of the type with which the general public — and copyright law — are already quite conversant.

Despite being written in languages unfamiliar to most of us, programs are not qualitatively different from traditional works of imagination in ways that should affect the protection available for their detailed internal and external designs.

Copyright is not only an appropriate form of protection for computer programs, but its application is also critical for their continued

Continued on next page

Clapes is senior corporate counsel at IBM, responsible for managing IBM's intellectual property and antitrust litigation. Material is excerpted from chapter 21 in *Software, Copyright and Competition: The Look and Feel of the Law* (Quorum Books, an imprint of Greenwood Publishing Group, Inc., Westport, Conn. 1989), pp. 207 to 215. Abridged and reprinted with permission of the author and Greenwood Publishing Group.



Steve Lyons

Soviet Union: Opening new doors

BY LAWRENCE SAVELL

For U.S. companies looking to harvest the products of inventors and designers in the Soviet Union, imminent changes in the way the Soviet government views and protects the fruits of private efforts indicate the time to reap may be about to come.

Among the products of greatest potential interest to U.S. businesses is computer software designed by the virtually untapped and growing legion of Soviet programmers.

It is generally agreed that the level of copyright protection afforded in the Soviet Union has failed to keep up with changing technological and political realities and needs. This deficiency is a reflection of the long-standing Marxist philosophy that there is no such thing as private property. As a result, intellectual property has been viewed as being in the public domain and unprotected; therefore, copying of software has been legal and rampant.

Changing Soviet law

Although current Soviet copyright law does not expressly include protection for computer software, changes are on the horizon.

The U.S./Soviet Union "Agreement on Trade Relations" signed by President George Bush and President Mikhail Gorbachev on June 1 during their summit in Washington, D.C., represents the first normalizing of trade relations between the two superpowers since 1951. It includes extensive provisions on copyrights and other intellectual property.

The agreement, which would become effective upon approval by Congress, reflects the Soviet government's promise to increase the level of protection afforded within their country. It therefore helps the Soviets reduce their economy's isolation while allowing Western investors interested in Soviet products and planning joint ventures with newly formed Soviet business cooperatives to obtain a greater measure of Western-style protection for their investments.

One article of the agreement provides for the "Protection of Intellectual Property." The two nations agreed to "ensure in accordance with the provisions of internal legislation, protection and implementation of intellectual property rights, including copyright on literary, scientific and artistic works such as computer programs and data bases . . ."

The parties agreed to "ensure that their international commitments in the field of intellectual property rights are honored." Thus, both nations "reaffirm[ed] the commitments made" in prior agreements, including those "made with respect to copyright in the

Continued on next page

Savell is an attorney at the law firm of Chadbourne & Parke in New York. The firm is a member of the Moscow-based joint venture Chadbourne, Hedman, Raabe & Advocates CCCP-International Lawyers, which provides legal services to Western and Soviet entities.

Soviet Union

FROM PREVIOUS PAGE

Universal Copyright Convention of September 6, 1952 . . ."

In the agreement, the parties also consented to provide "protection for computer programs and databases as literary works under the copyright laws . . ." The Supreme Soviet also directed the Council of Ministers to introduce this year for its examination draft legislation regarding intellectual property, creating conditions necessary for the USSR's participation in the International Berne Convention for the Protection of Literary and Artistic Works. The Soviet government agreed to introduce draft legislation in 1991 that will include the following:

- Extending copyright protection "to all types of computer programs, including application programs and operating systems that may be expressed in any language, whether in source or object code and regardless of their medium of fixation."
- Equating the "duration and level of protection for computer programs" to "that provided to other literary works."
- Allowing owners of a copy of a computer program to make or authorize the making of a single copy or adaptation of that program. The institution of more protective and progressive copyright legislation should help to foster the blossoming of the Soviet software industry — and its potential to eventually become the new Silicon Valley. •

The Tetris case

The vast financial potential of marketing Soviet-created products — as well as the pitfalls of dealing with a society where copyrights have historically been somewhat nebulous — are reflected in the experience regarding the game "Tetris."

Tetris is one of the hottest selling video and computer games in recent years. In Tetris, players manipulate descending geometric shapes to form solid rows at the bottom of the screen, using the available space as efficiently as possible. The shapes are combinations of four boxes (in Greek, "tetra" means "four"). The playing area is surrounded with changing pictures of Soviet scenes; catchy regional folk tunes play in the background.

Tetris was created in 1985 by Alexey Pazhitnov, a programmer and scientific assistant at the Soviet National Academy of Sciences in Moscow. The granting of rights by the Soviet government to import Tetris into the U.S. and elsewhere has been the subject of protracted and heated litigation between Atari Games Corp. and Tengen, Inc. on one side and Nintendo of America, Inc. and related entities on the other.

Andromeda strain

Atari and Tengen claimed rights to the game originating from the purchase of rights by Andromeda Software Ltd. from Electronorgtechnica (Elorg), a Soviet foreign trade agency. Mirrorsoft Ltd., a British company and division of Maxwell Communications, then acquired rights from Andromeda. Atari bought its rights from Mirrorsoft.

Nintendo, however, claimed ownership of certain specific rights relating to the Tetris game arising out of its own subsequent agreement with Elorg, allegedly conveying the worldwide handheld rights and an option for the lucrative home video rights to the game.

Nintendo subsequently issued a press release giving Atari notice of its rights to Tetris, and brought Tetris out for its regular home video game system and handheld Game Boy machines. To date, Nintendo has sold more than 2.5 million copies of the game.

Injunction granted

Claiming superior rights, Atari and Tengen filed suit against Nintendo for copyright infringement. However, the United States District Court for the Northern District of California granted Nintendo's motion for a preliminary injunction, enjoining Atari and Tengen from making, copying or distributing the game or any works copied, derived from or substantially similar to it.

The court held that the evidence did not show that either Tengen or its predecessors in the licensing chain were ever granted the television video game rights to Tetris.

The court pointed to numerous communications between the Soviet agency and its licensee showing that Nintendo was likely to prevail on the merits of its claim. Nintendo subsequently was granted summary judgment on its claim to home video rights to Tetris because the court ruled that Andromeda had purchased only the personal computer rights to the game. Thus, according to the court, Mirrorsoft and Atari had paid for something — the home video rights — that Andromeda did not own. Atari is appealing the decision and accuses the Soviets of knowingly selling the same rights to Nintendo that they sold to Andromeda.

LAWRENCE SAVELL

United States

FROM PREVIOUS PAGE

commercial availability. Other forms of protection do not provide adequate coverage. The principal additional forms of preserving the asset value of original software are patents and trade secrets — neither of which provide sufficient protection.

Patent protection. This is only available for software that contains inventions, which is only a small proportion of the software written in a given year. Moreover, when a program does embody an invention, protection is only available for those portions of the software package comprising the invention. IBM has a patent, for instance, on a particular method of checking for spelling errors by computationally matching the words in the text against candidate words from a stored dictionary. Spell checking is currently offered as part of many word processing systems. The patent covers only small portions of some of IBM's word processing programs.

Moreover, the patenting process is not a cheap one. Unlike copyrights, which arise automatically as soon as the program is written down or otherwise "fixed in a tangible means of expression," patent rights do not accrue until a patent has been issued by the patent office, and for that to happen, the inventor must prepare, submit and prosecute an application.

Trade secret protection. This mode of protection is commonly used in conjunction with copyright. Trade secret protection is only good as long as the code of the program is kept secret. For software distributed commercially, that may

Continued on next page

An issue in Europe and Japan, too

The software protection question is international in scope. The innovators and the clones — and their respective supporters in government and academia — jet around the world to seminars and meetings, trying to drum up support for their points of view. At such a seminar in Phoenix, early in 1989, there were lawyers and business professionals from Japan, a representative from the European Commission and a judge from Taiwan.

Not long ago, a seminar on "reverse engineering of software" sponsored by Japanese computer manufacturers was held in Berlin with speakers from the UK, U.S., West Germany and Japan. Articles on U.S. copyright law as it applies to software appear in European legal periodicals. Articles on Japanese copyright law as it applies to software appear in U.S. legal periodicals. The subject receives a lot of attention, and it deserves it.

The Commission of the European Community has recently had occasion to consider the various forms of protection available for computer programs in connection with a study of the need for harmonizing the laws of Common Market countries regarding legal protection for software.

It concluded that if research and investment in computer technology are to continue at a sufficient level to allow the Community to keep pace with other industrialized countries, protections are needed.

Specifically, in a proposal for a council directive on the legal protection of computer programs detailing its proposed harmonization, the EC said it was essential to create a legal environment that will afford a degree of protection against unauthorized reproduction of the computer program at least comparable to that given to works such as books, films, musical recordings or industrial designs.

In the commission's view, the "overwhelming weight of evidence . . . indicated that protection by copyright is the most appropriate measure to adopt." The commission further said that "within the framework of copyright, protection as a literary work is desirable" because a program "has all the characteristics of a literary work; namely, that it is the expression in language and in a perceivable form from which it can be reproduced of an idea or series of ideas, created by the expenditure of human skill and labor."

In Japan, the picture is mixed. The Japanese Ministry of International Trade and Industry (MITI) tried a few years ago to have a special law of software protection adopted in place of traditional copyright protection. The special legislation would have limited fairly substantially the scope of protection for software in Japan. The attempt failed, but MITI has not given up.

Meanwhile, the amendment to the Japanese copyright law that did pass the Japanese Diet excluded from protection "algorithms, rules and programming languages."

New recognition

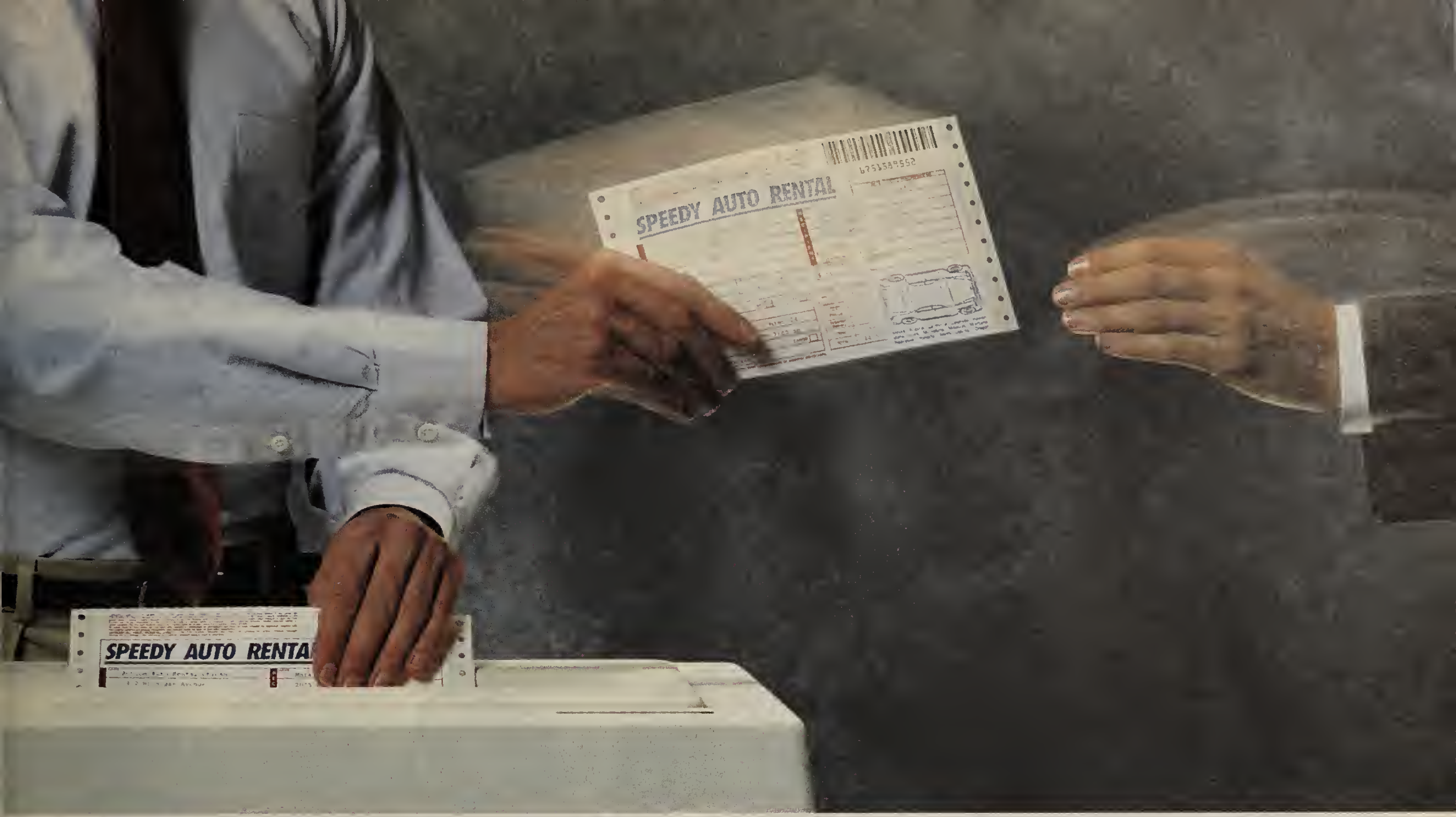
Even in Japan, however, where one after another of the world's industries has been overtaken by a strategy whose early phases have consisted of slavish copying, there is a new recognition that — at least in the case of software — a different strategy is necessary.

In major part, that realization is the result of the pressures put on Japan's industrial base by competition from the newly industrialized nations of the Pacific Rim, such as Korea, Taiwan and Singapore. Products from those nations are now not only eating into Japan's share of the U.S. market but also invading Japan itself.

With specific reference to software, Peat Marwick Main & Co.'s Yukuo Takenaka, head of the firm's Project Japan, says that Japan can become a global leader, but only if the Japanese government changes its attitude toward intellectual property protection. He says that this is not just a short-term business issue; rather, it is "a moral issue that demands that Japan adopt a global point of view in its truest sense."

In other words, intellectual property rights have now become "global business etiquette." Whether Takenaka's views will be more widely adopted in Japan remains to be seen.

ANTHONY L. CLAPES



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Continued from previous page

not be very long. Once competitors can acquire a copy of the program, even an object-code copy on diskette, the process of unraveling the secret begins. Software suppliers commonly attempt to protect themselves against loss of secrecy by contract.

> ONCE COMPETITORS can acquire a copy of the program, even an object-code copy on diskette, the process of unraveling the secret begins.

Although most authors of commercial programs distribute their products in object-code form only, specifically to preserve the source code as a trade secret, dumping, tracing and decompiling are all activities that compromise that secrecy. Accordingly, most software suppliers license their software under terms explicitly prohibiting such activities.

It is not clear how effective such provisions are. For one thing, the terms of those license agreements cannot prevent dumping, tracing, decompilation or other translation activities by persons who legitimately have access to the object code of the target program without being obligated under those agreements. For another thing, the narrow protectionists have moved beyond copyright and have begun clamoring for legislation that would render contractual prohibitions on reverse engineering unlawful.

Copyright is thus a critical mode of protection for the asset value of software despite the availability of patent or trade secret protection. It protects original expression, whether that expression is an invention or not, and, therefore, covers software writing more generally than patent protection. On the other hand, it does not provide the exclusory powers that patents do, and its broad applicability does not therefore risk hindering progress.

> COPYRIGHT is thus a critical mode of protection for the asset value of software despite the availability of patent or trade secret protection.

Unlike trade secret protection, copyright protection does not vanish if the work in question is made public.

In the U.S., the state of the law is clear: Computer programs are eligible for traditional copyright protection. As the body of case law expands, the paths through the gray area of the idea-expression dichotomy become clearer. An orderly unfolding is under way, providing a balanced legal environment for the further development of a vital industry.

As a medium of expression, software is evolving quite rapidly. The force behind that evolution is innovational competition. Copyright protection both induces and facilitates innovational competition by protecting original expression while simultaneously permitting the free use of ideas. While the trial of software copyright cases can present challenging problems of proof, the courts have succeeded so far in coming to grips with the facts and applying the well-known principles of copyright to those facts.

A useful and fascinating body of legal precedent is developing. Firms active in supplying software to users in the U.S. and elsewhere in the world know — or can know — what is expected of them when they choose to refer to their competitors' products in developing their own products. There is every reason to believe that the judiciary body will continue to succeed in adapting copyright doctrine to the arcane epic poetry of the Computer Age. ●

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Courtship rituals

Texas Instruments, Inc. returned last week to a lucrative arena: the federal court's patent jurisdiction. This time, TI is contending that **Analog Devices, Inc., Cypress Semiconductor Corp., Integrated Device Technology, LSI Logic Corp.** and **VLSI Technology, Inc.** have been using a patented chip-packaging process without benefit of license. TI wants the court to decree that licenses must be obtained; if it prevails, the firm will reportedly collect about $20,000 per year.

■

Ask and receive

Mountain View, Calif.-based **Ask Computer Systems, Inc.** broadened its marketing span and completed the management transition initiated last fall by founder Sandra Kurtzig's return as chief executive officer with the appointment of Eric Carlson as vice-president of engineeering and product operations. The position places Carlson in charge of product development not only for Ask's traditional Hewlett-Packard Co. and Digital Equipment Corp. platforms, but also for the more recently added IBM and open systems product lines.

More briefs on page 110

Parallel systems: United they stand

Computer firms, universities and their home state pitch in to plant 'Silicon forest'

BY J. A. SAVAGE
CW STAFF

BEAVERTON, Ore. — When Hewlett-Packard Co., Mips Computer Systems, Inc. and Sun Microsystems, Inc. aimed at developing a new architecture — reduced instruction set computing (RISC) — each of those Silicon Valley companies pursued the market in its own competitive way.

A handful of companies cultivating another new architecture — parallel computing — in the Portland, Ore. area are developing it in their own competitive ways as well, but they are also developing it together, for the benefit of all of them and with an added economic benefit going to the state of Oregon.

The extra benefit to users, vendors said, will be code that runs faster on parallel computers and could be leveraged to other architectures.

Parallel computing itself is not new; some of its prototypes date back to the early 1980s. What has kept it from taking off before now is a lack of software, particularly for commercial applications. For the most part, new algorithms must be devised to spread computations over many CPUs at once to take advantage of the architecture. That's where the consortium comes into the picture.

Called the Oregon Advanced Computing Institute, or Oacis, the consortium will not carry products all the way to application software for specific firms, but it will take them approximately 90% of the way, said Sudir Bhagwan, president of the group.

"None of our companies are big enough to do the research and development themselves," Bhagwan said.

All together now...

Several Portland-area companies are counting on their combined efforts – and those of the state and universities of Oregon – to benefit the development of a parallel computing market

Company	Processor Architecture	1989 Sales	Target Market
Sequent Computer Systems, Inc.	Up to 30 concurrent	$145 million	Commercial: Platforms - Intel 386-based, Unix-based, computers with shared memory
Intel Corp.	Scientific Intel 386 or I860 processors	$20 million	Scientific: Up to 128 processors, Unix and proprietary distributed memory
NCube	Proprietary processors	N/A	Scientific: 64 to 8,000 processors, Unix and proprietary, distributed memory
Cogent Research Inc.	Up to 32 INMOS T800 processors	N/A	Scientific: Proprietary with Unix emulation, distributed memory, with hypercube or shared memory emulation

N/A=Not available

CW Chart: Paul Mock

Indeed, of the five principal hardware companies involved, Sequent Computer Systems, Inc. is the largest, with revenue of $145 million last year. While Sequent continues in-house software development, it will get to market faster if it takes "raw" software from Oacis and fine-tunes it for the company's particular architecture, said Stephen Verleye, core products marketing manager for the company.

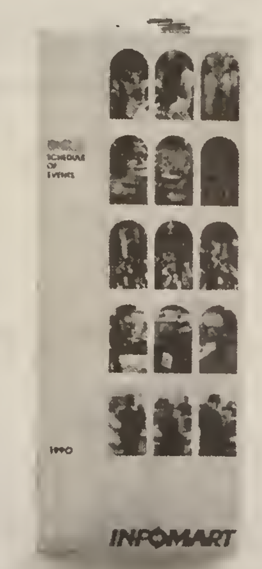
In establishing Oacis last October with a $5 million grant, Oregon Gov. Neil Goldschmidt stated, "The institute is pooling the talents of these companies and computer scientists from Oregon universities into research activities they all can use but none alone could afford."

With a well-publicized decline in the availability of high-quality timber to build Oregon's primary industry, the state is looking to diversify its economic base. In an effort to keep Oacis from going the way of some other consortia — such as the Austin, Texas-based semiconductor-oriented Sematech — that had little federal funding and are now suffering from withering support, Oregon is actively pushing a technology policy.

Practically, parallel software will be able to take existing applications and break them into pieces to be run concurrently on many processors. "Traditional algorithms were devised for sequential processing, even though the problem may be inherently parallel," said Wendy Vittori, director of marketing at Intel Scientific Computers.

"Code and algorithms get old, like computers," said Steve Colley, president of NCUBE. "The side benefit of parallelizing software is that people are revisiting programs.

"Mathematics keeps moving," he said. "Fifteen years ago, the best way to solve a problem was this [particular algorithm]. Then it got buried in a program. When software developers look at it again, they could use new math and make it run twice as fast."



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Dorenfest diagnoses ills of hospital IS

BY MICHAEL FITZGERALD
CW STAFF

CHICAGO — Weak and wan, hospital information systems vendors visited the doctor late last month and came away with a prescription for rapid, radical change.

Former colleague-turned-consultant Sheldon Dorenfest played the role of doctor, telling some 80 attendees at his Eighth Annual Conference on Business Opportunities in the Hospital Market that they had fallen behind the times in the strategic use of information.

"You have to change," Dorenfest said.

Dorenfest cited statistics taken from the Dorenfest 3000+ Database, which contains information on more than 3,000 American hospitals. The numbers showed hospitals spending $4.05 billion on IS in 1989, up only 4.5% from 1988 totals. By way of contrast, total hospital spending in 1989 rose 9.1%.

Whereas last year he predicted that hospitals would spend $6 billion on IS in 1993, this year Dorenfest revised that figure down to $5 billion.

He also chided vendors for shipping products before they were finished.

Tough customers

Vendors in attendance generally agreed with Dorenfest. Most of them, however, focused on the difficulty of dealing with hospitals.

"They [users in hospitals] complain about things, and a lot of the complaints are legitimate," said Joanne Clark, who left a hospital radiology department to become a marketing manager for Community Health Care Corp., a maker of systems for hospital labs and radiology units.

"But it's difficult to come up with the things users want, because things change so fast," particularly government regulations, she added.

Cliff Carroll, director of business development at Ferranti Healthcare Systems Corp., an $18 million supplier of turnkey information systems for long-term and acute patient care and patient scheduling, agreed. "It's really difficult to automate 47 different procedures with multiple signatures required for all of them," he said.

The hospital IS vendor community, Carroll said, suffers from complaints familiar to IS vendors in general — a lack of standards and the diversity of potential customers.

"Every hospital is a different business," he said. Moreover, "you have different factions within [each of] them, usually divided between the financial side and the clinical side, and they don't have the same priorities," he added.

In addition, Dorenfest said, hospitals tend toward inflated expectations of what the relatively young hospital IS products market currently can provide. In response, he said, vendors frequently oversell product features they cannot deliver. As a result, Dorenfest said, current systems are inflexible, difficult to use, lacking in necessary features and slow.

For example, Dorenfest noted, much has been made of Health Level 7, an evolving standard software protocol for inexpensive, fast interfaces between systems. However, he said, it was being "oversold" and was just the beginning of a solution.

"This is a marketplace where things are all screwed up," Dorenfest said. "This industry is [stuck] in the early 1980s and late 1970s; hospitals are making the kinds of mistakes that banks made in the early 1980s," oversimplifying their needs in the hopes of getting systems that will automate their whole process, he said.

IS is not a top priority for most hospital administrators, said Tito Weiss, senior vice-president of Florida Hospital, an 1,100-bed facility in Orlando.

However, Dorenfest stressed repeatedly that hospitals will spend much more heavily on HIS when software improves.

In 1863,
S. Langhorne
Clemens
decided to change
his name.

SEC says consulting, auditing can mix

BY ELLIS BOOKER
CW STAFF

Accounting firms can do consulting work for their audit clients provided they keep the two functions separate, according to a recent ruling by the Securities and Exchange Commission (SEC).

While the SEC ruling could spur consulting alliances between accounting firms and their computer company clients — deals that the old rule discouraged — and might even simplify mergers between accounting companies, critics said they were worried it could undermine the integrity and objectivity of the auditing process.

Up until now, the SEC has pulled a blackout shade down over accounting firms that wanted to do consulting work for their audit clients. The earlier rule prohibited them from direct or materially indirect business relationships with the companies they audit.

Earlier this month, however, the SEC ruled in favor of a request by Chicago-based Arthur Andersen & Co. to reconsider the prohibition in light of Arthur Andersen's new corporate structure. Last year, Arthur Andersen separated its accounting, tax and auditing business and its fast-growing consulting businesses. The two units now report to parent Arthur Andersen & Co. S.C. in Switzerland.

The SEC said consulting work can be done for audit clients so long as it has no "material" impact on any of the parties. A "material" impact is usually one with significant revenue implications for either party.

In March 1988, prior to Arthur Andersen's restructuring, the SEC had turned down a similar petition from Arthur Andersen and two other accounting firms.

This month's retreat from the earlier hard line "could be viewed as a plus for consulting service buyers," Andersen Consulting Managing Partner and Chief Executive Officer George T. Shaheen said.

Dallas-based Electronic Data Systems, which does some consulting but is best known as a systems integrator, "has no problems living with [the SEC ruling] and looks forward to competition in the open market," spokesman Jon Senderling said.

However, Senderling added, "To say an auditor will not be influenced by the business his company is doing [for the audit client] is a little naive." Senderling said it was incumbent on the SEC or some other governmental agency to follow up the ruling with strict monitoring.

Turnkey tools unbundling

MOUNTAIN VIEW, Calif. — Traditional turnkey system vendors are unbundling their systems and moving toward software and services to sustain growth into the mid-1990s, according to a recent report by market research firm Input, Inc.

Turnkey system vendors, which aim their product lines at narrow vertical business applications, are finding that systems standards are making their business less dependent on platforms, and they are changing their business structure to cope.

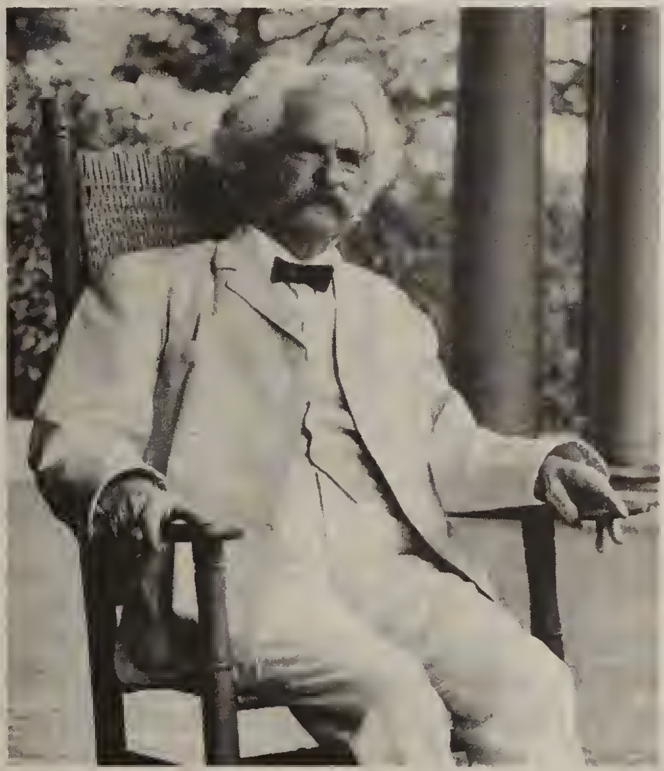
"Historically, many firms have financed their software application development through profits made from the hardware portion of their turnkey systems solution. As the profit margins from the capital equipment portions continue to decline, alternative sources for capital to fund product development become a major issue," the report said.

While Input estimated that growth will continue at about 10% for the next four years, the total systems package, including hardware, will decline.

Input suggested that turnkey system firms emphasize licensing of new products and providing interfaces to other standard software products.

J.A. SAVAGE

It worked for him.



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Lotus takes inward look to see future

ANALYSIS

BY PATRICIA KEEFE
CW STAFF

CAMBRIDGE, Mass. — Between bombarding users with a wide-reaching and potentially confusing array of its 1-2-3 spreadsheets and peppering competitors with copyright infringement suits, Lotus Development Corp. has found the time to take a hard look inward.

Twice this year the spreadsheet maker has tinkered with its internal business structure, most recently in the last two weeks [CW, July 2]. These adjustments, which have included a reshuffling of the executive deck, have come during a 12-month period in which the company has rebuilt a crumbling reputation, boosted once-worrisome financials and garnered a self-satisfying court victory.

The machine-gunned delivery this year of an armful of products not only fleshed out a 2-year-old shadow of a cross-platform strategy but also relieved Lotus of a public relations nightmare.

The new products have boosted both sales and the company's image. A court victory following a three-year fight has set the stage both for building a foundation for software copyright law and for potentially adding at least several million dollars to the Lotus coffers.

Lotus has learned the hard way neither to dwell on its past exploits nor to adhere rigidly to product plans. Although the company favors an OS/2 environment, it said it will heed user interest in Microsoft Corp.'s Windows with a 1-2-3 port.

These days the company is keeping a close eye on the future, watching both its competition and emerging markets.

The most recent reorganization appears to focus on the latter issue. "We will change the [internal] structure to reflect opportunities that we see," Lotus Senior Vice-President Frank King said. Toward this end, two executives — David Roux and Frank Ingari — have been moved into planning roles to seek new market opportunities, potential acquisitions and strategic investments. "There is a tremendous piece of the computer software business in markets where today we have no products or presence," King said.

Battling Medusa

"Now that their strategy with Novell has unraveled, they have to think about how they can attain the critical mass necessary to compete head-to-head with Microsoft," said Barbara Isgur, a vice-president at Needham & Co. "Microsoft is a many-headed Medusa with tentacles everywhere, where Lotus has a strong share in only one area of the market. I think Lotus thinks that unless it has enough components to play in several areas and stay abreast of trends, it will become irrelevant."

This is important because Lotus, which is about to head into a slower growth period along with the rest of the software industry, is coming off a failed merger that was to have set the tone for much of its future product direction. Moreover, some of its new offerings have either failed to excite — for example, 1-2-3 Release 3.0 — or will require longer sales cycles, such as Notes, compact disc/read-only memory products and the host-based spin-offs of 1-2-3.

To coordinate those efforts, King — who himself came to Lotus to whip development into shape — created a position to enable former IBM colleague Don Casey to oversee the next stage of 1-2-3's growth. Casey was most recently vice-president of networking operations at Apple Computer, Inc., and his abrupt departure after less than two years there has raised some eyebrows.

"I've been after him for a long time," King said, describing Casey as an avid personal computer user who has many years of experience in a wide range of areas, including databases, networking, the Apple Macintosh, marketing and development.

Lotus 1-2-3 remains king of the hill in the spreadsheet market, and it still generates roughly 60% to 70% of the company's revenue. Therein lie two threats, according to analysts, who said the spreadsheet market is about 80% saturated. As such, Lotus needs to find other sources of revenue to carry the ball. "Lotus is attempting to broaden the definition of a spreadsheet by using it as a connecting point between mainframes, minis and micros," said John Maxwell III, a technical analyst at Dillon, Read & Co.

Meanwhile, many market research firms said that Lotus' sales have either remained steady or have dipped somewhat, while Microsoft's Excel and, more noticeably, Borland International's Quattro Pro have picked up market share.

Some critics hold that the real reason behind Lotus' current copyright infringement suit against Borland and The Santa Cruz Operation [CW, July 9], which has seen the greater growth in market share, is to quash the competition.

Lotus' biggest problem right now, according to David Cearley, a software analyst at Gartner Group, Inc., is that it lacks a clear vision — not of what to do, but how to do it. "How complete is their [cross-platform and networking] vision and how sincere is it?" he said.

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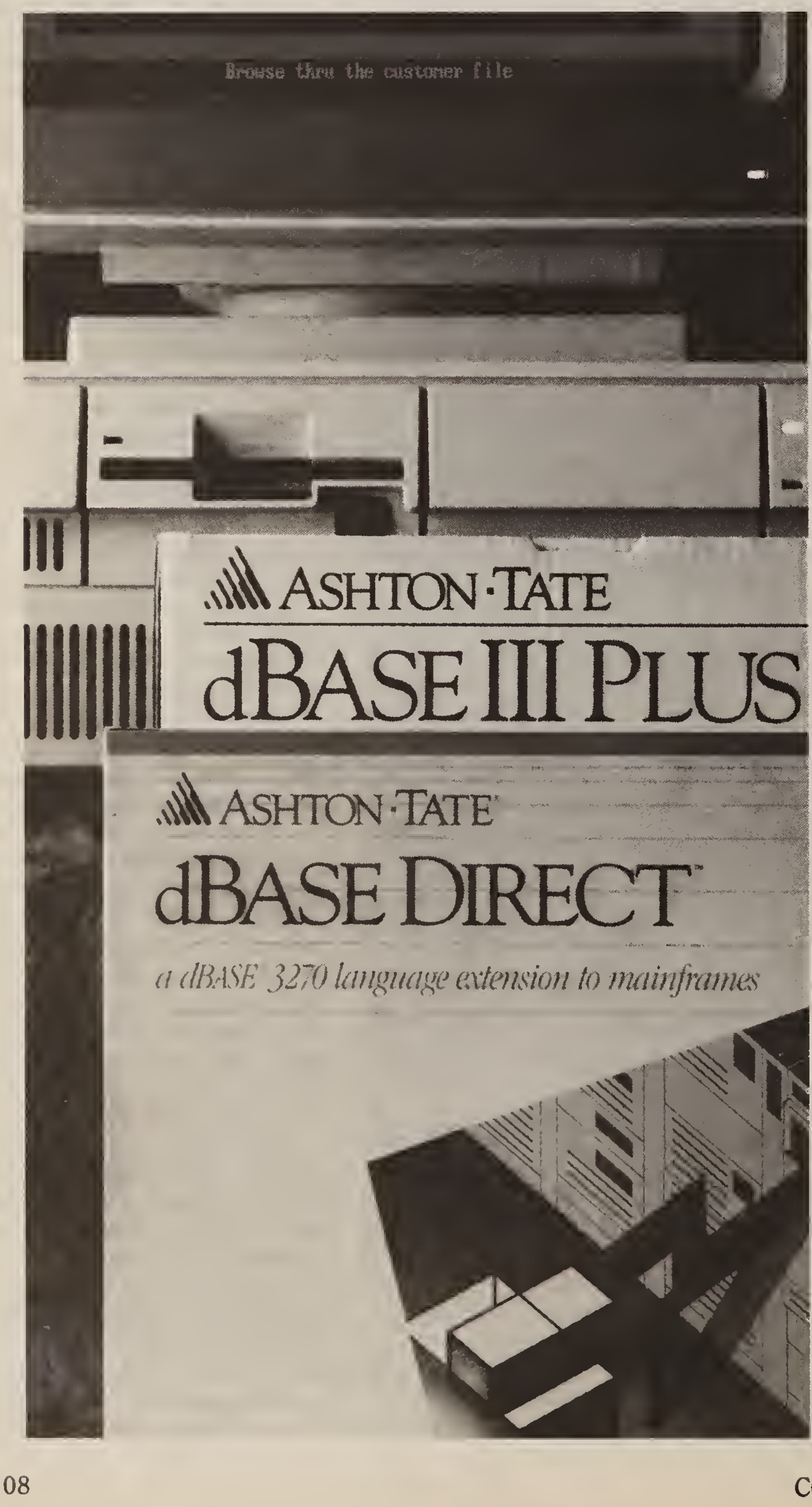
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Taiwan software firms ponder world market

BY CHRIS BROWN
IDG NEWS SERVICE

TAIPEI, Taiwan — Facing a long-term transition from a manufacturing to a service economy, Taiwan industry and government leaders are growing increasingly interested in the global software market.

So far, however, interest does not equal action. Taiwan is up against national stumbling blocks such as software piracy [CW, July 9] and a reliance on Chinese programs. Many industry representatives in Taipei are calling on the government to lead the way in software as it did in hardware 10 years ago.

It is still far from clear how this should be done, however. The rise of Taiwan's personal computer and computer component sectors in the early 1980s hinged on government efforts to underwrite research and development and manufacturing costs. Tax breaks and state-led research paved the way.

The trend now is toward services. Taiwan's Council of Economic Planning and Development forecast that by the next century, 50% of the island's gross national product will come from services. Recent growth in the services sector has topped 7% per year.

Predictions are running high that software services will grow sharply in Taiwan but that overseas sales will be small. This was the concern voiced when a delegation of 16 Taiwanese software developers, users and market watchers held a press conference earlier this month after attending the World Computing Services Industry Congress in Washington, D.C., early last month.

Their belated observations based on the show and a subsequent tour of major U.S. software producers — including Oracle Systems Corp., Computer Associates International, Inc. and IBM — brought them to the same conclusion: Taiwan should take steps now to ensure that it will not miss out on the next wave in the software market.

However, there is no consensus yet as to how this should be accomplished. Speaking at the press event, Hwang Taiyang, president of Information Integrated, called on the government to clarify its software tendering procedures and to move away from a "price only" attitude in evaluating tenders.

Others, such as Arthur Hwa, vice-president of Taipei-based Information Management Systems, noted that

NATIONAL
BRIEFS

It's buying time again

Hewlett-Packard Co. is about to acquire Edmonton, Alberta-based **Idacom Electronics Ltd.**, a privately owned vendor of protocol testing products with a strong track record in the crafting of research and development alliances, according to HP. Details of the deal, which will be done through HP's Canadian subsidiary, were not released. "For the foreseeable future," however, HP said, Idacom will keep its 120 employees, its Edmonton address and its product focus when it becomes a division of the HP communications test business unit.

■

Hard times

John J. Barry, president and chief operating officer of Reston, Va.-based software vendor **Systems Center, Inc.**, resigned last week, ceding his duties to Chairman and Chief Executive Officer Robert E. Cook. The reasons for Barry's sudden departure from the executive suite — he remains on the firm's board — may be rooted in his successor's first announcement from the presidential podium: a warning that the firm, dragged down by the costs of two recent acquisitions, expects to report a loss for its recently closed second quarter.

■

Over the Pacific

Unisys Corp. veteran executive Edward Blechschmidt last week became president of the company's Pacific Asia Americas Division, a 7,500-person unit that added some $2 billion to Unisys' bottom line last year. In his new office, Blechschmidt will oversee 19 subsidiaries and 18 distributorships as well as joint ventures in Japan, India and Thailand. It won't be entirely new terrain; prior to the promotion, the 37-year-old executive served as Unisys' vice-president for Japan operations and president of **Unisys Japan Ltd.**

Taiwan firms face a maddening barrier in communications with their overseas operations. Hwa's firm has been writing tailor-made applications for U.S. clients for the last three years, mostly based on the IBM mainframe family platform. It is about 25% cheaper to develop software in Taiwan than in the U.S., he said, but the distance makes it difficult to communicate, especially on custom jobs.

There is increasing interest in Taiwan in packaged software, although in the past, most of Taiwan's success in this sector has been limited to Chinese language programs. To spur development in Taiwan, the government-sponsored Institute for Information Industry (III) has launched a Chinese version of Unix and the X Window System interface.

Huang Wei-teh, vice-president at the III, said that he thinks packaged software on the new Unix workstations poses a good opportunity for Taiwan. Five Taiwanese firms have already made plans to introduce Sun Microsystems, Inc.'s Scalable Processor Architecture (Sparc)-based Unix machines over the next five years.

Foreign attraction

This number will almost certainly grow. The III has just finalized its Sparc workstation and will soon be looking for firms that want to license the technology. However, many in Taiwan said they feel that one of the keys to developing the local industry is attracting overseas firms to do design work here. This, Huang said, would ideally be one stage of a broader move into Asian markets — especially an expansion into China.

The latter opportunity appears to be long-term at best. Several speakers predicted that Taiwan will one day oversee software code work and packaging on the mainland and then sell the end products overseas. However, this scenario could take 10 years to unfold, they said.

In the meantime, the III plans to submit proposals to the Ministry of Economic Affairs addressing ways to encourage software development in Taiwan. Investment incentives, especially at the Hsinchu Science-based industrial park and at a similar park to be built in Yunlin County, are likely to be one of the main tools proposed.

INTERNATIONAL BRIEFS

Up, up and away

Japanese firm **Mitsubishi Electric Corp.'s** acquisition last month of UK-based personal computer maker **Apricot Computers Ltd.** marked the company's first purchase of an entire company rather than a division, asset package or product line. Now Mitsubishi has announced plans to use Apricot — complete with the newly launched Intel Corp. 80386SX-based diskless workstation — as a wedge into PC markets first in the U.S., then in West Germany and finally across Europe. Apricot, operating as a Mitsubishi subsidiary, will also run its new parent's first foreign-based research and development center in Birmingham, England.

■

Not so fast

The **Hong Kong** government is about to put its supercomputing project on hold for three to five years, according to reports last week. Neither the government nor its information technology subcommittee would comment officially, but sources close to the project said the committee was persuaded by a report prepared by a team of outside consultants that advised Hong Kong to plan ahead without making commitments to any one supercomputer strategy or vendor.

■

Meanwhile, in Malaysia . . .

The **Malaysian** government is expected to unveil a national technology policy at the International Conference on Information Technology and Information Technology Exposition that Malaysia will host in September. "In view of the fact that the information technology industry is [$370 million] in size and a hive of increasingly important activity," the announcement should draw a keenly interested audience, said Abdullah Abdul Rahman, director-general of the Malaysian Administration and Management Planning Unit.

■

Holding onto a good thing

UK-based computer-aided software engineering (CASE) tools developer **Intelligent Environments Ltd.** based its CASE products on OS/2; now, the firm said last week, it is also basing its European distribution strategy on IBM. According to Chief Executive Officer Laurence Shafe, distribution partnership agreements with IBM subsidiaries in Denmark, Switzerland and the Netherlands are only the beginning: Similar deals in other countries will follow. Shafe said his company's goal is to replicate in Europe the success its Application Manager tool set is having in the U.S.

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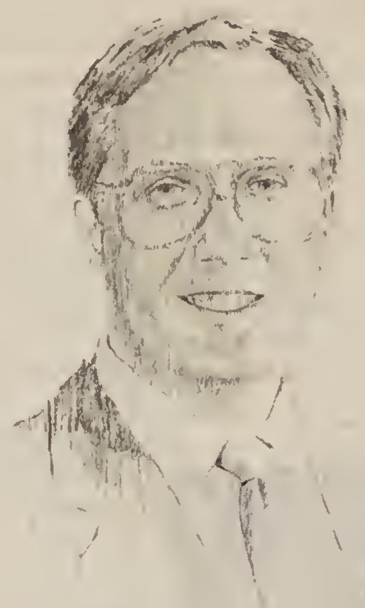

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Maintenance is looking good

As a career, it offers challenge, education, stability and healthy pay

BY JANET RUHL
SPECIAL TO CW

Among the misconceptions that haunt the information systems field, none is more pervasive than this: A career in systems maintenance means going nowhere. The belief is that managers and programmers "stuck" in maintenance are not good enough to make it onto hot development teams.

A survey of 124 managers and programmers who attended the annual meeting of the Software Maintenance Association in April tells a different story. It suggests that, compared with many of their peers, maintenance professionals may be more experienced, better paid and more likely to have won a recent promotion.

According to the survey, the median salary of this group of self-defined maintenance professionals is $49,000. Fifteen members of the group earn more than $70,000 per year; the highest salary reported was a whopping $150,000. Sixty-eight percent have been working in the field for more than 10 years, and a surprising 23% have been in IS for 20 to 35 years. Finally, the results suggest that these careers are still viable: A full two-thirds of the group reported being promoted within the last two years. (To learn more about the activities, publications and chapters of the Software Maintenance Association, contact administrator Robin Gross at (707) 643-4423.)

Of course, maintenance people have suffered their share of layoffs and career setbacks in the recent push for corporate downsizing. Nicholas Zvegintzov, editor of *Software Maintenance News*, polled a sample of his readers in February and reported that 11% have left their jobs in the past year and another 23% plan to leave soon. He says many seem to have become "jumpier" over the last year, chiefly in response to layoffs within their company. Several managers he spoke with said they need to hone their technical skills and perhaps return to a more technical career path to keep moving ahead. However, Zvegintzov concludes that despite the unease, maintenance professionals are "holding their own."

One reason for their confidence is that maintenance can offer unparalleled opportunities for building both technical and business skills. In a tight job market, the more skills you possess, the more employable you are.

Maintenance pros develop these skills because maintenance groups are usually understaffed, leaving the responsibility for hundreds of modules and thousands of lines of code with a handful of people. Development teams may employ tiers of software engineers, systems analysts, business specialists, liaison personnel and coders, each with strictly defined boundaries to their roles. Meanwhile, maintenance staffers assigned to support a system often find that they must fill all these roles.

In addition, development groups must work within the constraints of rigid methodologies that limit the impact any one individual can make on the system. In their more unstructured environment, maintainers are expected to show initiative and use any available resources to foresee and solve problems.

People who succeed in this environment are flexible self-starters who can handle the unexpected. They teach themselves how to work in unfamiliar software environments armed only with manuals because they can't wait for the company to send them to a course. Good maintenance staffers design and develop the quick and dirty utilities that may save their companies thousands of dollars during the life of a system.

However, the maintenance environment teaches more than technical skills. Because their groups are understaffed, maintenance people usually interact directly with users without the intermediary groups typical of development teams. They also learn the workings of an entire system rather than focusing on the details of smaller units. For both reasons, they are more likely than developers to master the business issues relating to their systems.

> IN THIS AGE of organizational downsizing, maintenance professionals have one further edge over developers: They produce a steady stream of achievements to add to their resumes.

Maintenance staffers must interact on a daily basis with the technical support staff as well as users at all levels, so they also may have more opportunity than developers to hone communications skills.

Finally, in this age of organizational downsizing, maintenance professionals have one further edge over developers: They produce a steady stream of achievements to add to their resumes. The individual achievements may not be as impressive as the accomplishments of a successful development team, but the truth is, not all development teams are successful. Many development projects never get implemented; they are canceled after developers have spent a lot of time and ink on the preliminaries, leaving little to show for their efforts. Even with successful development teams, the lion's share of kudos often goes to a small number of people while the rest of the team remains anonymous.

In contrast, says Judith Marx Golub, president of the Software Maintenance Association, maintainers experience the "constant gratification" of solving large and small problems day after day. Producing consistent and visible results can give the successful maintenance professional a high profile within the company and a reputation for competence. This kind of visibility can tip the balance when companies are making decisions about downsizing.

Ruhl is a consultant and programmer in Connecticut and author of *The Programmer's Survival Guide: Career Strategies for Computer Professionals.*

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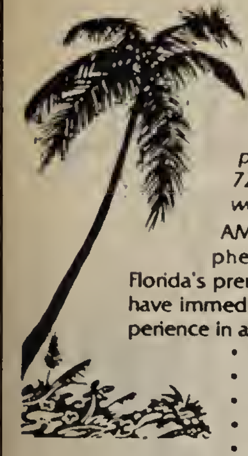

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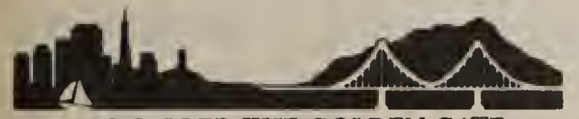

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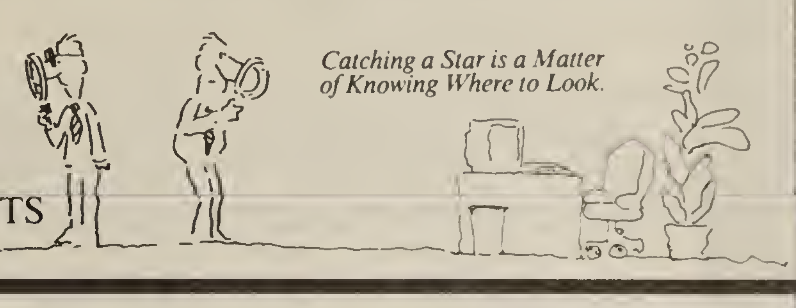

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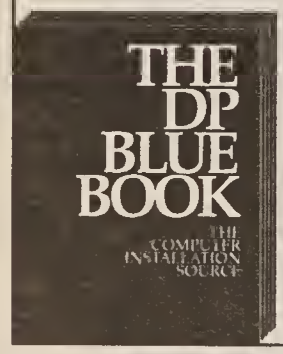

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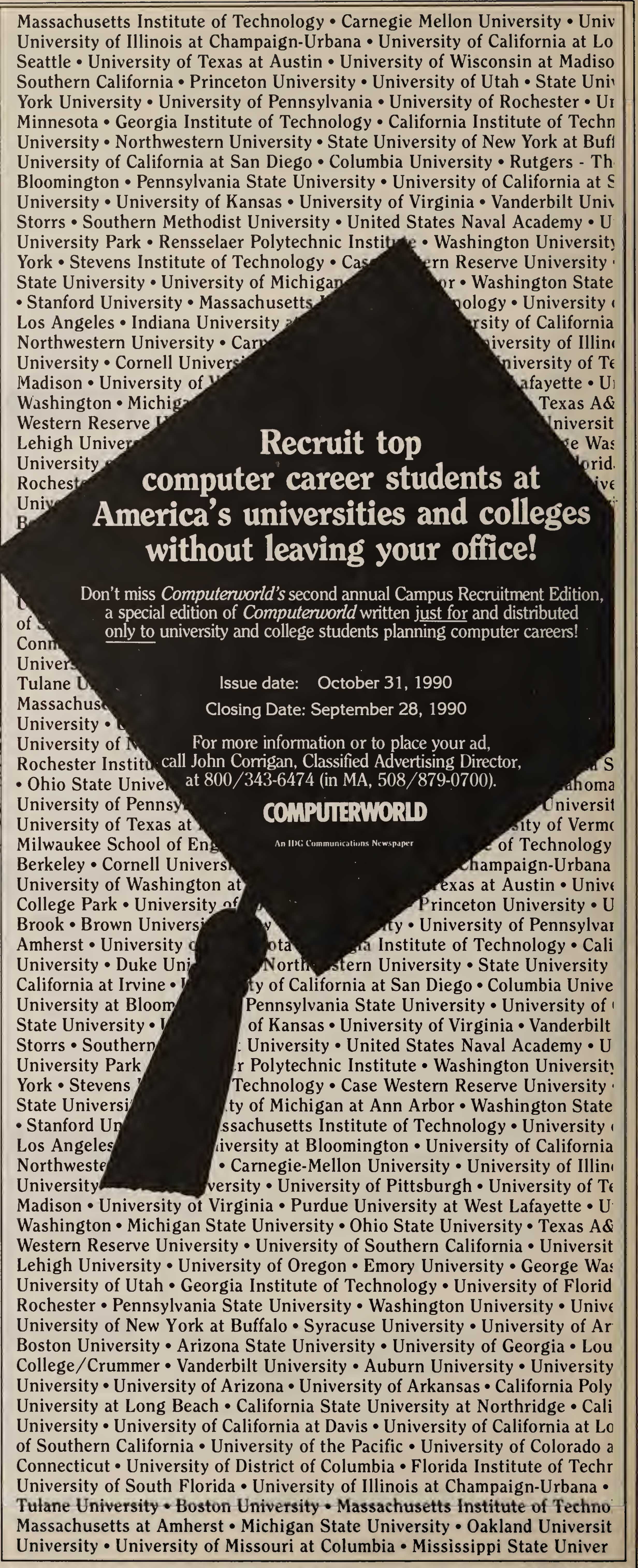
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MARKETPLACE

Picking appropriate technology

There are plenty of money-saving options; the trick is how to evaluate them

BY THOMAS D. OLESON
SPECIAL TO CW

To their detriment, many companies espouse a single philosophy for the acquisition of hardware and stick to it religiously. Some companies worship new technology regardless of circumstances. Others deny the value of new technology regardless of the implications. Still others stress mainframes and discourage or even forbid midrange and microcomputer-based systems for production applications.

These doctrinaire beliefs are totally inappropriate given today's requirements. Companies need solutions that are flexible, responsive to the user, cost-effective and serviceable by the organization — what I call appropriate technology. This approach avoids reliance on a single supplier, a single architectural philosophy and a single hardware platform.

The central proposition is to pay top dollar for systems only when the expense will yield a compelling advantage. Otherwise, companies should investigate a less expensive solution, such as used equipment, hardware from plug-compatible manufacturers (PCM) and perhaps midrange and microcomputer systems.

If you think this notion of appropriate technology is self-evident — like apple pie, motherhood and the American flag — I agree. The real question is how a company can apply the principle.

Acquisition decisions should be based on a cost/benefit analysis. The key to such decisions is to evaluate cost-effectiveness on a present value basis, considering expenses of hardware, software, maintenance, floor space and environmental controls.

The analysis must take into account any need for connectivity. It's important to realize that integration with an enterprise's technology infrastructure depends more on connectivity issues to be solved by in-house programmers than on vendor support. Managers must recognize the ability of their technical personnel to service the system and its network.

Last but not least, adoption of an appropriate technology strategy requires the people charged with hardware and software acquisition to align plans with users' requirements. In doing so, they must do the following:

- Consider the nature of the applications serviced by the equipment, particularly whether they are strategic.
- Provide sufficient initial compute cycles and weigh the need for growth in those cycles.
- Understand the software implications of the operating system and the development and application tools it supports.

Let's look at an organization whose mainframe processor begins to reach its limit. For most firms, the typical response is an expensive upgrade to the latest technology or replacement of the CPU with a larger one, whether new or used or from the same vendor or a PCM.

However, let's not limit our thinking to bigger processors. The move by many vendors to equate the cost of software with the size of the processor it runs on makes other options more appealing. By upgrading to a higher class CPU for the sake of a few applications, you're increasing the cost of all the software running on the processor. Consider a small machine — whether new or used — to run some of the applications.

In approaching this alternative, review the mix of applications on the processor. Could some of them run successfully on the current version of the operating system for years? If so, consider a smaller, used processor to relieve pressure on the main CPU. Are other applications so critical that they must stay current with technology? If so, you may want a second, small CPU that is state-of-the-art.

Compare the financial implications of a second processor and the larger state-of-the-art CPU in terms of all the relevant factors. Take into account the tendency for software and maintenance costs to inflate at a rate greater than the cost of borrowed money. Make certain you consider the shorter life of today's CPUs: You cannot justify 60-month depreciation with such rapid technological change, so you should not use it in the financial analysis.

The questions don't end with comparison of a single large CPU and two smaller machines. The appropriate move may not entail a CPU upgrade. Two such examples come to mind.

It may be better to upgrade the machine's memory or operating system rather than the CPU itself. Depending on the condition of the I/O subsystem, a memory upgrade could provide sufficient relief for a while. This option underlines the need for the equipment manager to work closely with the people charged with fine-tuning systems.

Many organizations operate around the clock. However, if your organization doesn't run three shifts and your CPU is bumping up against maximum use, a second or third shift to handle batch jobs might be far less expensive than a new, $8 million CPU. This step would lead to appropriate use of your current technology.

Of course, all of this analysis is dependent on several factors beyond costs: the users accepting the functionality of the alternative, its reliability and a judgment that any risks associated with a used machine or equipment from a PCM are appropriate.

Oleson is financial director of information processing at John Hancock Financial Services in Boston.

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The BoCoEx index on used computers

Closing prices report for the week ending July 6, 1990

	Closing price	Recent high	Recent low
IBM PC Model 176	$400	$660	$250
XT Model 086	$500	$700	$350
XT Model 089	$675	$825	$475
AT Model 099	$1,050	$1,375	$850
AT Model 239	$1,075	$1,325	$700
AT Model 339	$1,325	$1,400	$900
PS/2 Model 50	$1,300	$1,700	$1,050
PS/2 Model 60	$2,500	$2,600	$2,400
Compaq Portable II	$1,475	$1,725	$1,400
Portable III	$2,175	$2,500	$1,900
Portable 286	$1,500	$1,875	$1,300
Plus	$675	$750	$650
Deskpro	$825	$900	$800
Deskpro 286	$1,400	$1,625	$1,300
Deskpro 386/16	$2,500	$2,750	$2,475
Apple Macintosh 512	$375	$775	$275
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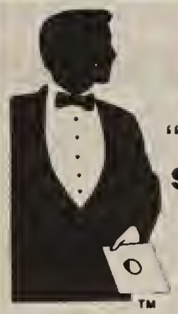

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Moving over from Cobol to C

Before training, think about your staff and its project schedule

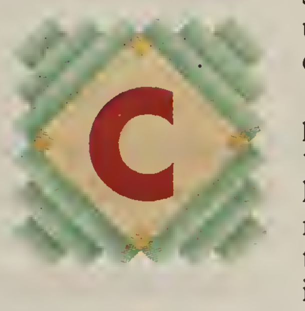
BY JESSICA KEYES
SPECIAL TO CW

For the last 20 years or so, Cobol has reigned supreme as the programming language of choice in most businesses. But today Cobol is facing some serious competition.

A few years ago, the typical Cobol shop ran centralized mainframes tethered to dumb terminals; today's organization is anything but centralized, featuring local- and wide-area networks, minicomputers, workstations and personal computers. With all this newfangled hardware, it's no wonder managers are looking for software tools that can run on all of it and handle increasingly complex requirements as well. For many companies, one answer has been C.

If your organization is planning the leap to the C language, it's going to take more than buying a new compiler. It's going to take careful planning and, most of all, training. The information systems manager must take into account a few unassailable points about the move from Cobol to C and plan a training program accordingly.

• **Cobol inertia.** First, there are billions of dollars invested in Cobol programs, so there will always be a need for Cobol programmers. The savvy manager realizes that he needs either bilingual programmers or both C and Cobol factions. He also realizes there are many programmers who just don't want to learn a new language. Generally, they have been writing Cobol for so long they know it as well as English; these people get their kudos from expertise in Cobol, and learning a new language would put them back at square one, a place they'd rather not be. If Cobol is where they'd rather be, leave them there. They'll revel in maintaining those billions of dollars of Cobol code.



• **Once trained — use it or lose it.** Once the programming manager has selected candidates for C training, he should take stock of the schedule of deliverables and modify it to accommodate new C programmers.

The manager should plan training to coincide with the launch of new projects. If a staff member is working on a Cobol project when he goes into a C class, putting him back on the project would negate the training — unless the manager has set aside some modules that can be coded in C.

Because new C programmers are on the low end of the learning curve, the manager must adjust the schedule accordingly. If he projected a three-week development effort for a Cobol module, he might try five weeks for this first attempt in C.

• **The dangers of C.** C is also a systems programming language; the operating system can be changed in ways that might make the traditional programming manager quite nervous. A change in one application, for example, might leave others running on the same processor inoperable. It's wise to tackle this sticky subject during training. Some of C's powerful constructs may not be needed in a given application. A thorough review of the features will let the programming manager develop a list of functions and libraries that programmers should avoid. Training can either bypass them or cover them with a warning not to use them without permission.

• **The distributed shop.** Although C is touted as the most portable of programming languages, differences creep in when it is run on different hardware platforms. If training is to cover C programming for both IBM and Digital Equipment Corp. hardware, for example, it must take into account differences in libraries, editors, compilers and linkage executions.

• **Implementation issues.** Once the manager has decided who to train and what to cover, he must decide how to train. There are three chief options: live training, video and disks. Live training is usually best; nothing beats human interaction and the camaraderie among students confronting the same tasks. While desirable, however, this approach may be impractical in many cash-starved firms.

Fortunately, there are quite a few vendors ready to step in. Nearly every PC-based C compiler comes with a tutorial on the language. While they're usually thorough, these tutorials are geared to the individual self-starter more than to a firm training a large number of people.

I can recommend two training programs, although I suggest shopping around before buying. The C Workshop, which is from Wordcraft in Oakland, Calif., and available at computer bookstores, includes a set of disks and a 350-page text. To use it, make sure that students are self-starters. If such people are not to be found, Zortech, Inc.'s video course may be the ticket. Zortech, located in London and Arlington, Mass., has combined 10 videos, text and a reference manual along with its C compiler.

There's no getting around it: C is becoming the programming language of choice. In luring staff members from Cobol to C, the wise manager needs to do some careful planning to balance the needs, wants and fears of his staff, new features of the language, the schedule of deliverables and training methodologies.

Keyes is president of New Art, Inc., a management and computer consulting firm in New York.

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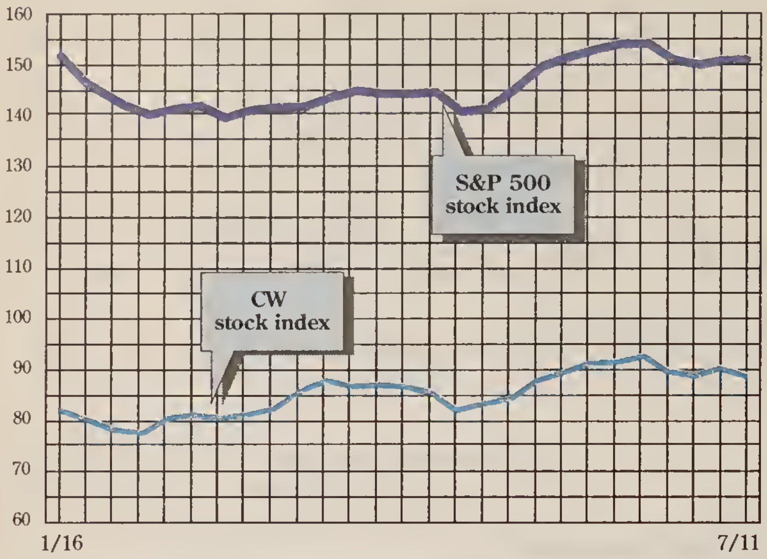
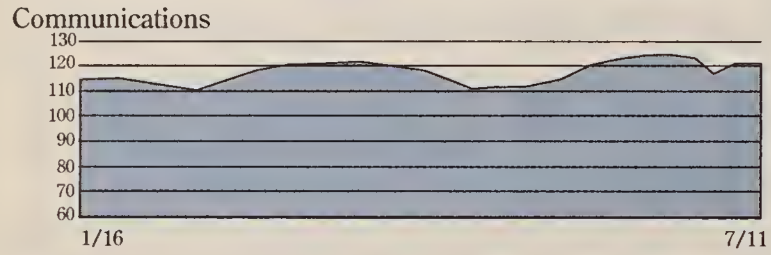
COMPUTERWORLD

P.O. Box 2043, Marion, Ohio 43305

STOCK TRADING INDEX



Indexes	*Last Week*	*This Week*
Communications	121.5	**121.4**
Computer Systems	88.5	**87.0**
Software & DP Services	130.4	**130.0**
Semiconductors	61.6	**61.0**
Peripherals & Subsystems	96.5	**93.3**
Leasing Companies	78.2	**76.4**
Composite Index	90.2	**88.9**
S&P 500 Index	152.1	**152.6**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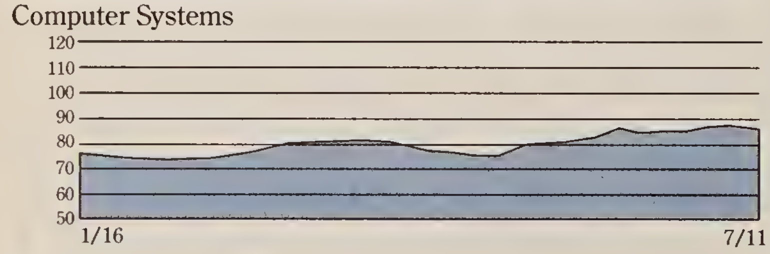
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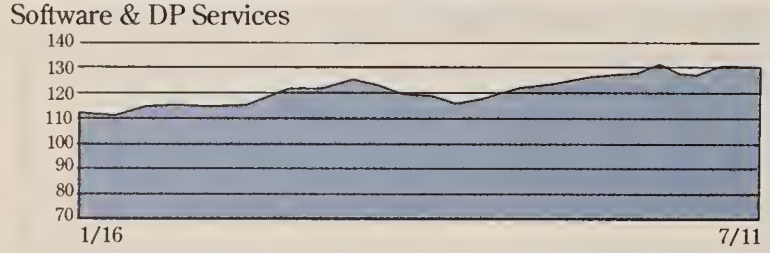
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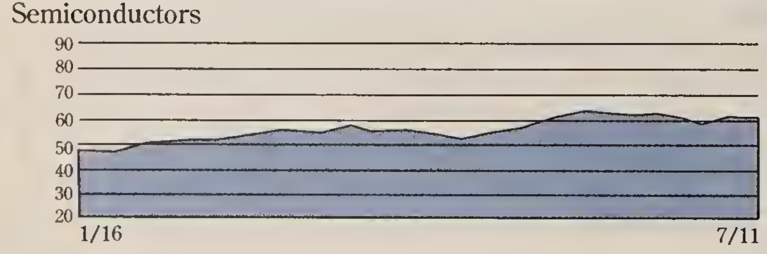
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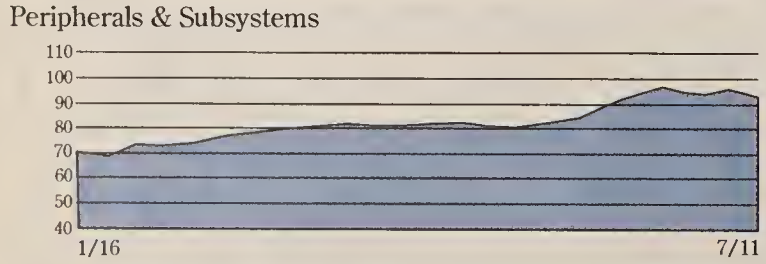
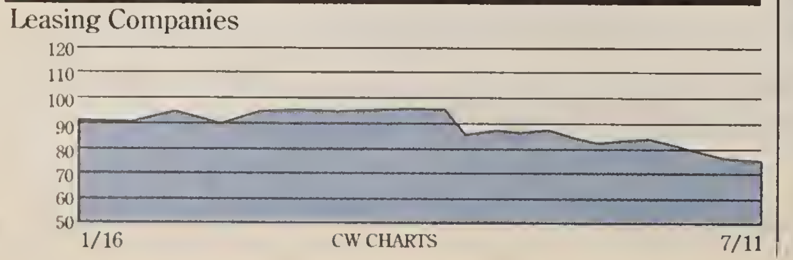

Peripherals & Subsystems


Leasing Companies

CW CHARTS

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JULY 11, 1990

Communications and Network Services

EXCH		52-WEEK RANGE		PRICE CLOSE JULY 11, 1990	PRICE WEEK NET CHNGE	PRICE WEEK PCT CHNGE
N	AMERICAN INFO TECHS CORP	68	55	59.625	-1.4	-2.3
Q	ANOREW CORP	26	19	20.5	1.3	6.5
Q	ARTEL COMM CORP	10	4	4.875	0.0	0.0
N	AT&T	47	36	37.375	-1.3	-3.2
Q	AVANTEK INC	7	2	3	0.1	4.3
N	AYOIN CORP	21	13	14.5	0.3	1.8
N	BELL ATLANTIC CORP	57	43	46.5	-3.3	-6.5
N	BELLSOUTH CORP	59	49	50.625	-2.4	-4.5
Q	COMPRESSION LABS INC	16	7	16.125	1.5	10.3
Q	CONTEL CORP	37	23	28	0.4	1.4
Q	DATA SWITCH CORP	4	2	3.375	-0.1	-3.6
Q	DIGITAL COMM ASSOC	27	17	23.75	0.6	2.7
Q	OYNATECH CORP	21	15	16.125	-0.1	-0.8
Q	FIBRONICS INTNL INC	13	5	11.875	-0.3	-2.1
Q	GANDALF TECHNOLOGIES	7	2	3.75	-0.1	-3.2
N	GENERAL DATACOMM INOS	7	3	3.875	0.4	10.7
N	GTE CORP	36	28	31	-1.4	-4.2
Q	INFOTRON SYS CORP	11	3	3.75	0.0	0.0
N	ITT CORP	65	51	57.875	0.4	0.7
N	M A COM INC	9	3	4.875	-0.4	-7.1
Q	MCI COMMUNICATIONS CORP	49	31	40	-2.5	-5.9
N	NETWORK EQUIP TECH INC	34	8	8.25	-0.8	-8.3
Q	NETWORK SYS CORP	15	7	14.5	0.4	2.7
N	NORTHERN TELECOM LTD	30	18	28.875	0.5	1.8
Q	NOVELL INC	57	24	56.25	2.5	4.7
N	NYNEX CORP	92	75	79.75	-3.0	-3.6
N	PACIFIC TELESIS GROUP	52	41	42.25	-1.9	-4.2
A	PENRIL CORP	9	4	8.5	0.3	3.0
N	SCIENTIFIC ATLANTA INC	29	19	28.5	0.8	2.7
N	SOUTHWESTERN BELL CORP	65	51	51.875	-2.4	-4.4
Q	3 COM CORP	19	10	17.75	1.4	8.4
N	U S WEST INC	41	33	35.875	-0.6	-1.7

Computer Systems

EXCH		52-WEEK RANGE		PRICE CLOSE JULY 11, 1990	PRICE WEEK NET CHNGE	PRICE WEEK PCT CHNGE
Q	ALLIANT COMPUTER SYS	9	4	5.438	-1.0	-15.5
Q	ALPHA MICROSYSTEMS	8	2	2.5	-0.5	-16.7
Q	ALTOS COMPUTER SYS	8	5	8.25	0.9	11.9
A	AMOAHL CORP	18	11	18.125	1.0	5.8
Q	APPLE COMPUTER INC	50	32	47	3.0	6.8
Q	AST RESH INC	26	7	25.5	2.3	9.7
N	BOLT BERANEK & NEWMAN	9	4	5.125	0.0	0.0
N	COMPAQ COMPUTER CORP	66	37	64.5	-58.6	-47.6
N	COMMODORE INTNL	13	6	7.75	-0.4	-4.6
N	CONTROL OATA CORP	23	16	18.875	-0.1	-0.7
N	CRAY RESH INC	51	31	47.375	2.5	5.6
N	OATA GEN CORP	19	8	10.625	-0.6	-5.6
N	DATAPOINT CORP	6	2	2.5	0.3	11.1
Q	OELL COMPUTER CORP	14	5	13.625	1.3	10.1
N	OIGITAL EQUIP CORP	103	70	86.625	2.9	3.4
N	FLOATING POINT SYS INC	4	0	3	0.0	0.0
N	HARRIS CORP	40	28	32.75	-1.5	-4.4
N	HEWLETT PACKARO CO	58	40	47.25	-0.6	-1.3
N	HONEYWELL INC	105	73	104.5	2.4	2.3
N	IBM	122	93	119.125	1.5	1.3
Q	INFORMATION INTL INC	16	12	12.75	-0.4	-2.9
Q	IPL SYS INC	14	5	11.5	1.0	9.5
N	MAI BASIC FOUR INC	6	2	2	-0.3	-11.1
N	MATSUSHITA ELEC INOL LTO	180	123	144.25	4.3	3.0
Q	MENTOR GRAPHICS CORP	26	14	18.5	0.9	5.0
N	NBI INC	3	0	0.313	0.0	-9.0
N	NCR CORP	72	53	64.25	0.3	0.4
Q	PYRAMIO TECHNOLOGY	36	10	28.75	-0.3	-0.9
Q	SEQUENT COMP SYS INC	34	12	31	1.3	4.2
Q	SUN MICROSYSTEM INC	36	13	35.5	2.4	7.2
Q	SYMBOLICS INC	2	0	0.313	-0.1	-28.5
N	TANOEM COMPUTERS INC	30	17	23.875	0.3	1.1
N	TANDY CORP	49	30	37	0.6	1.7
N	ULTIMATE CORP	11	5	7.375	-0.3	-3.3
N	UNISYS CORP	25	12	13.25	-0.3	-1.9
A	WANG LABS INC	7	4	4.375	0.3	6.1

Software & DP Services

EXCH		52-WEEK RANGE		PRICE CLOSE JULY 11, 1990	PRICE WEEK NET CHNGE	PRICE WEEK PCT CHNGE
Q	AMERICAN MGMT SYS INC	18	11	17.75	0.1	0.7
Q	AMERICAN SOFTWARE INC	27	14	25.5	-0.5	-1.9
N	ANACOMP INC	7	2	2.75	0.1	4.8
Q	ANALYSTS INTL CORP	24	14	22.75	2.8	13.8
Q	ASHTON TATE	18	9	11.75	-0.9	-6.9
Q	ASK COMPUTER SYS INC	15	7	10.125	1.4	15.7
N	AUTO OATA PROCESSING	59	40	56.375	0.0	0.0
Q	AUTOOESK INC	59	33	58.5	4.5	8.3
Q	BMC SOFTWARE INC	30	13	28.25	2.0	7.6
N	BUSINESSLANO INC	14	7	7.875	0.1	1.6
Q	COGNOS INC	9	4	9	-0.3	-2.7
N	COMPUTER ASSOC INTL INC	20	11	16.5	0.5	3.1
Q	COMPUTER HORIZONS CORP	16	7	14.5	1.0	7.4
N	COMPUTER SCIENCES CORP	59	40	44.75	-1.0	-2.2
N	COMPUTER TASK GROUP INC	14	9	10.25	0.1	1.2
Q	COMSHARE INC	25	15	23.75	-0.3	-1.0
Q	CORPORATE SOFTWARE	15	8	13.25	-0.8	-5.4
N	GENERAL MTRS (CLS E)	38	24	37.5	2.9	8.3
Q	GOAL SYSTEMS INTL	18	10	15	-0.8	-4.8
Q	HOGAN SYS INC	7	4	3.625	-0.1	-3.3
Q	INFORMIX CORP	17	8	16.75	1.1	7.2
Q	INTELLICORP INC	8	3	7.125	-0.6	-8.1
Q	LEGENT CORP	32	19	25	-1.5	-5.7
Q	LOTUS OEV CORP	39	21	32.5	-2.0	-5.8
Q	MICROSOFT CORP	79	26	75.5	3.5	4.9
Q	NATIONAL DATA CORP	35	13	15	0.0	0.0
N	ON LINE SOFTWARE INTL INC	11	6	8.5	-0.3	-2.9
Q	ORACLE SYS CORP	188	15	19.875	-2.8	-12.2
N	PANSOPHIC SYS INC	19	10	13.75	-0.5	-3.5
Q	PHOENIX TECHNOLOGIES INC	7	2	4.25	-0.3	-5.6
N	POLICY MGMT SYS CORP	43	30	41.875	0.6	1.5
Q	PROGRAMMING & SYS INC	25	16	23.5	-0.8	-3.1
Q	RELATIONAL TECH INC	11	5	6.375	-0.1	-1.9
N	REYNOLDS & REYNOLDS CO	27	19	20.125	-0.6	-3.0
Q	SAGE SOFTWARE INC	16	7	13.375	-0.3	-1.8
Q	SEI CORP	22	15	21.5	0.5	2.4
Q	SHAREO MEO SYS CORP	17	12	12.75	0.1	1.0
Q	SOFTWARE PUBG CORP	28	13	24	0.4	1.6
N	STERLING SOFTWARE INC	11	7	10.125	-0.4	-3.6
Q	SUNGARO DATA SYS INC	26	17	24.25	0.0	0.0
N	SYSTEM CENTER INC	26	17	17.875	-4.3	-19.2
N	SYS. SOFT INC	29	15	26.5	-0.8	-2.8
Q	WOROSTAR	2	1	1.094	0.0	-2.8

Semiconductors

EXCH		52-WEEK RANGE		PRICE CLOSE JULY 11, 1990	PRICE WEEK NET CHNGE	PRICE WEEK PCT CHNGE
N	ADV MICRO DEVICES INC	11	7	9.375	-0.1	-1.3
N	ANALOG OEVICES INC	11	7	7.25	-0.1	-1.7
Q	ANALOGIC CORP	11	8	9.25	-0.3	-2.6
Q	CHIPS & TECHNOLOGIES INC	26	15	21.5	0.3	1.2
Q	INTEL CORP	49	28	48	0.5	1.1
Q	MICRON TECHNOLOGY INC	18	7	13.125	-0.6	-4.5
N	MOTOROLA INC	88	53	86.375	0.9	1.0
N	NATL SEMICONOUCTOR	9	5	6.875	-0.4	-5.2
N	TEXAS INSTRS INC	44	28	39.125	-0.1	-0.3
A	WESTERN OIGITAL CORP	15	6	13.75	0.3	1.9

Peripherals

EXCH		52-WEEK RANGE		PRICE CLOSE JULY 11, 1990	PRICE WEEK NET CHNGE	PRICE WEEK PCT CHNGE
Q	ALLOY COMP	2	0	0.688	-0.1	-12.0
N	AM INTL INC	6	2	2.5	0.0	0.0
Q	AUTO TROL TECH CORP	5	2	3.313	-0.4	-11.7
Q	BANCTEC INC	24	13	20.25	0.0	0.0
A	COGNITRONICS CORP	8	3	5.875	0.1	2.2
Q	CONNER PERIPHERALS	29	10	27.75	-0.3	-0.9
A	DATARAM CORP	22	8	20.875	2.4	12.8
N	EASTMAN KODAK CO	52	36	39.875	-1.1	-2.7
N	E M C CORP MASS	7	3	5.5	-0.3	-4.3
Q	EMULEX CORP	9	4	7.125	-0.1	-1.7
Q	EVANS & SUTHERLANO	35	18	27.75	-1.8	-5.9
Q	ICOT CORP	2	1	1.625	0.4	30.0
Q	INTERLEAF INC	9	5	6.625	-0.1	-1.9
Q	IOMEGA CORP	6	3	5.75	0.8	15.0
Q	LEE DATA CORP	3	1	1.375	0.1	4.7
Q	MASSTOR SYS CORP	4	1	1.063	-0.1	-10.5
Q	MAXTOR CORP	17	7	14.875	-0.5	-3.3
Q	MICROPOLIS CORP	9	3	7.875	0.0	0.0
N	MINNESOTA MNG & MFG CO	90	68	89.5	1.9	2.1
Q	PERSONAL COMP PROOUCTS INC	5	4	3.938	-0.1	-3.1
Q	PRINTRONIX INC	15	7	13.125	0.4	2.9
N	QMS INC	21	8	18.75	0.3	1.4
Q	QUANTUM CORP	25	9	24.875	2.4	10.6
N	RECOGNITION EQUIP INC	12	4	5.25	0.0	0.0
Q	REXON INC	10	6	7.375	-0.5	-6.3
Q	SEAGATE TECHNOLOGY	20	10	14	-0.3	-1.8
N	STORAGE TECH CORP	35	9	32.625	-2.0	-5.8
Q	TANDON CORP	4	0	3.813	0.1	1.7
N	TEKTRONIX INC	23	12	15.875	-0.3	-1.6
Q	TELEVIOEO SYS INC	1	0	0.313	0.0	-9.0
N	XEROX CORP	69	45	45	-1.4	-3.0

Leasing Companies

EXCH		52-WEEK RANGE		PRICE CLOSE JULY 11, 1990	PRICE WEEK NET CHNGE	PRICE WEEK PCT CHNGE
N	CAPITAL ASSOC INTNL INC	8	3	2.875	-0.3	-8.0
N	COMOISCO INC	34	17	18.125	0.0	0.0
Q	LDI CORPORATION	18	13	15.75	-0.3	-1.6
Q	PHOENIX AMERN INC	5	3	3.5	-0.3	-6.7
Q	SELECTERM INC	9	5	5.125	0.1	2.5

EXCH: N=NEW YORK; A=AMERICAN; Q=NATIONAL

Carnival rides

Some investors left the midway after low-earnings forecast

Step right up, folks, and take a look at the latest giant stock drop to follow negative earnings news — that of Computer Associates International, Inc. After the company said its first quarter financials would fall below estimates, CA lost 5⅝ points for the week, closing Thursday at a new low of 10¼.

CA was not alone, however. Although Oracle Systems Corp. showed bigger and better numbers on its fourth-quarter earnings statement, the improved figures were not enough to appease investors. The company's shares slipped 3½ points to 19, its first weekly drop in more than two months. Elsewhere in the software sector, Microsoft Corp. picked up 4¼ points to 77½. Novell, Inc. jumped up 3⅞ points to 57¾ after announcing a two-for-one stock split. 3Com Corp. and IBM each climbed 2 points, to 18¾ and 120, respectively, after news that the two will work together on network management products.

The ballyhoo surrounding this year's Decworld '90 exhibition and the unveiling of a new Microvax minicomputer may have helped boost Digital Equipment Corp.'s stock price to 86⅜, a 3-point gain. Amdahl Corp. also advanced, rising 1 point to 18⅜, while NEC Technologies, Inc. slipped ⅜ of a point to 66½.

The rash of semiconductor lawsuits continued as Texas Instruments, Inc. filed patent infringement actions against five smaller chip makers last week (see story page 103). TI closed at 40⅛, up 1⅜ points. Motorola, Inc., which agreed more than two weeks ago to settle its fracas out of court with Hitachi Ltd., racked up 1¼ points to 86⅜ on the tails of a positive earnings statement.

KIM S. NASH

Nynex eyes AI system savings

BY JOANIE M. WEXLER
CW STAFF

WHITE PLAINS, N.Y. — If Nynex Corp. can actually save its projected $4 million to $6 million per year with the expert system now running in 40 of its maintenance centers, customers could end up two-time winners.

Expert systems use artificial intelligence technology to capture the knowledge and experience of human experts and embed their decision-making rationale in software. Nynex announced last week that it has been using an expert system, the Maintenance Administrator Expert (Max), to diagnose problems with residential and small-business telephone services. The company said it plans to test a larger business version of Max — which would accommodate private branch exchanges and Centrex service — by the end of the year.

The savings will come primarily from "fewer erroneous dispatches," said Jim Euchner, expert systems director at Nynex. Users should reap improved customer service benefits, he said, because the system, which operates around the clock, takes 10 seconds to screen phone troubles, compared with five to 10 minutes by a human.

Customers may also see lower phone service rates or network enhancements, because Nynex is regulated by rate-of-return legislation, which caps regional Bell operating company (RBOC) earnings at about 12%, according to William Pomeroy, director of telecommunications public policy at the International Communications Association.

Rate-of-return legislation, he noted, mandates that any RBOC profits above and beyond that ceiling must be passed on to the ratepayer in the form of reduced rates, or the profits must be reinvested in upgrading and expanding the local network.

Other RBOCs are in various stages of developing similar expert system applications, Euchner said. For example, Bell Atlantic Corp. reported that it has realized "significant savings" for several years using its own expert system.

Euchner stressed that Nynex's immediate goal with its expert system is "not to eliminate manpower" but to free up testers' time to do more productive work, such as preventive maintenance. He added, however, that in the long run, "we may need fewer people to do the job."

Is this the party. . .?

Though Nynex acknowledged that the "bawdy" private parties reported in *The Wall Street Journal* last week did take place, the company denied suggestions that the activities may have translated into improper costs to Nynex customers.

In a statement, the telephone holding company responded to an article in last Thursday's *Journal* reporting that during closed regulatory proceedings in a state rate case for Nynex's New York Telephone unit, evidence emerged about "raucous" annual week-long gatherings at Florida resorts that were attended by employees of Nynex's purchasing unit, Materiel Enterprises Co., and several Nynex suppliers from 1984 to 1988.

The *Journal* report said the parties included illicit activities such as prostitution and that the evidence draws a correlation between suppliers' attendance at the conventions and the volume of Nynex business steered to them.

Nynex stated that corrective action, including the dismissal of two employees, was taken in 1988. The firm said the action was the result of investigations conducted by Nynex and non-Nynex professionals. Nynex said the investigation found that none of the Nynex family of companies engaged in business activities that resulted in improper costs to Nynex customers.

Weather

FROM PAGE 1

tornado in Limon, Colo., that they claimed went undetected by a Doppler system near Denver, 110 km away.

- Representatives of the National Weather Service Employee Organization said the new system creates a greater work load for meteorologists at a time when the government is streamlining its staff.
- Other meteorologists said the weather service, which has managed the project from its inception, has been overly secretive about system details.
- Supporters of Doppler radar criticize the slow flow of funds to the project.

The U.S. departments of Defense, Commerce and Transportation joined forces in 1979 to form the Next Generation Weather Radar Project, or Nexrad, the agency that has mothered the computer technology needed to develop WSR-88D.

Under the project, the 175 stations will be built by early 1996, Don Sarreals, special assistant to Nexrad's director, Samuel Williamson, said. Of that number, 120 will be managed in the U.S. by the National Weather Service, 38 will be used by the U.S. Air Force, and 17 will be operated overseas near U.S. military installations.

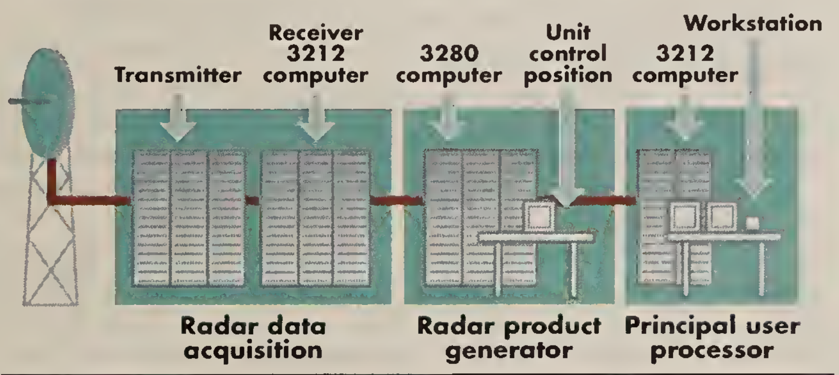
Nexrad is one to two years behind schedule, according to various government sources. However, it is not over budget, according to Sarreals.

Doppler radar itself has existed since the 1950s, according to Marvin Miller, National Weather Service area manager for Ohio. While conventional radar pictures are simply echoes bounced off objects, Doppler systems act like a police officer's radar gun trained on water, ice, insects and dust in the air. The systems can tell if objects are moving toward or away from the transmitter as well as their speed. In this way, Doppler systems can see phenomena such as wind shear, tornadoes and heavy rain as they form.

However, the complex and voluminous data revealed by Doppler equipment took days to process by previous computers, creating what amounted to "game films" for meteorologists to review, Miller said. Information output by Doppler systems "can fill up a wastebasket in a couple of seconds as it crunches algorithms [representing] how the atmosphere is believed to work," said Ken Crawford, director of the Oklahoma Climatological Survey.

Weather watch

Doppler radar system uses Concurrent Computer processors



CW Chart: Tom Monahan

"The [Nexrad] program is extremely software-intensive," said Art Hansen, formerly the Federal Aviation Administration's weather radar program manager.

Concurrent Computer Corp. in Tinton Falls, N.J., a Nexrad subcontractor, is providing one 3280 and two 3212 superminicomputers for each station to process all the data into color displays and weather forecasts. Concurrent's 3280, the larger of the two systems, has an I/O response rate of 40M byte/sec., providing real-time analyses of Doppler signals, according to a company spokesman.

All this may come as a shock to U.S. radar technicians and meteorologists accustomed to working with technology no more current than 1974. Much of the service's existing equipment, in fact, was purchased in 1957, Sarreals explained.

"You can't sit behind this thing with Piper Cub knowledge," Crawford said. "You have to have Stealth [aircraft] knowledge." Crawford was Oklahoma area manager at the National Weather Service for seven years, working closely with Nexrad at its Norman, Okla., Doppler prototype site until last year.

David Powell, president of the National Weather Service Employee Organization, said any knowledge of the system has been hard to come by. Powell, who said he supports efforts to update radars, reported that members have had to use the Freedom of Information Act to find out key features of the project.

One source who helped manage the project as it developed and who requested anonymity said that is a legitimate concern. "Employees have been kept in the dark for so long," the source said.

Resentment has built up, the source said, and that has made concerns grow into major contentions among many meteorologists.

Reasons for secrecy

Defending the secrecy, Ron Alberty, director of the Norman prototype, said, "There was a stage when we had to be very careful with the information publicly disseminated to preserve fair competition between Unisys and Raytheon as they prepared to bid on the project."

Powell said that what he has learned about the Doppler radar makes him cautious. Asked if the system could have saved any lives if it had been operating June 14 in Ohio, when Shadyside was washed from the face of the Earth, Powell said: "If it was being operated by a competent person, and the location of the radar was close enough to the storm, it might have." He said that 70 to 80 km is a Doppler's maximum accurate range.

A less sophisticated Doppler system in Pittsburgh, Miller said, was unable to predict or spot the Shadyside storm. A similar example is the Limon tornado earlier this year, he said.

Powell said that another such Doppler station near Denver saw only "mild [air] circulation." The operator of a conventional radar system noted severe weather, however, and issued an advisory.

Alberty admitted that there has been some "confusion" about Doppler's tornado-spotting abilities. Smaller tornadoes, he explained, can be clearly seen only to about 80 km. Larger funnels can be seen out to 230 km.

To be at its most accurate, the system must be used by sharp meteorologists, said Ed Berkowitz, chief of systems in Nexrad's engineering branch. "If you try to trust the computer guidance, you'll be disappointed," Berkowitz said. "If you combine the computer algorithm with the trained human brain, it's an unbeatable combination."

It is a matter of writing better software to accommodate limitations in radar hardware, Alberty said. He said he believes that software improvements will greatly extend tornado range within "a year or two." His own beef centers on what he said has been foot-dragging by bureaucrats holding the project's purse strings.

Meteorologists anxious to trash their current vacuum-tube systems are nonetheless worried that Nexrad's answer may be too much. Neal Marchbanks, fire and weather forecaster in Anchorage, Alaska, said Doppler systems may have "too many bells and whistles."

"It's very labor-intensive," said Marchbanks, who is national vice-president of the National Weather Service Employee Organization. It can take two or three people to keep up with it, Marchbanks claimed.

Doppler systems can produce literally dozens of ways of looking at any storm: hourly storm accumulation, large-scale wind patterns, microbursts of wind, storm tracking and other more esoteric aspects.

On top of that, Nexrad will increase the area each meteorologist monitors, Marchbanks said. "When you are working a short-fuse situation, such as a tornado, you have to be able to get a warning out to the people in a very short time," he said. "You may not be able to perform all the functions that this thing has to accomplish."

Stardent's Michels sues backer

BY NELL MARGOLIS
and JAMES DALY
CW STAFF

SAN FRANCISCO — Stardent Computer, Inc. co-founder Allen H. Michels cast the word "pioneer" last week in a new light when he filed a $50 million lawsuit charging Kubota Ltd., a strategic ally and 22% stakeholder in his company, with conspiring to steal Stardent's technology.

Stardent itself was not a party to the suit. President and Chief Executive Officer J. William Poduska was also conspicuously absent from both the legal pleadings and the statements issued by Michels and Stardent Co-Chairman Matthew Sanders.

Stardent was formed in 1989 from the merger of then-rival supercomputing workstation makers Stellar Computer, Inc. — founded by Poduska and based in Newton, Mass. — and Ardent Computer, Corp., founded by Michels and based in Sunnyvale, Calif.

Naohisa Matsuda, vice-president of Kubota Corp. in Santa Clara, Calif., in a prepared statement Friday afternoon expressed disappointment with the suit. Matsuda rejected the charges and said Kubota "learned of these claims several weeks ago when Michels and Sanders approached us secretly — obviously hoping to extract a payment . . ."

Kubota, a 100-year-old agricultural equipment maker based in Osaka, Japan, was an Ardent investor and 44% shareholder. Under the merger agreement, which Michels claims was forced by Kubota, it became 22% owner of Stardent.

Analysts following the workstation arena, in which Stardent has scrambled with questionable success for player status, reported months' worth of rumblings of management-level discord at the firm. No one, however, reported being aware of ill will between Stardent and Kubota.

In the suit filed in Santa Clara Superior Court last Thursday, Michels and Sanders said that the merger was a shotgun wedding, forced by Kubota on threat of withholding critical financial aid from Ardent. Subsequently, according to the complaint, Kubota contrived to shift key personnel and technology from Stardent into a wholly owned Kubota subsidiary created this past spring and located in Santa Clara.

"This case is a flagrant example of the Trojan horse technique, by which small creative American companies are being controlled, then swallowed up by large Japanese concerns," said Joseph Alioto, attorney for Michels and Sanders, in a prepared statement.

Flammable comments

One Wall Street analyst who follows the workstation sector referred to Alioto's remarks as inflammatory. However, added Frederic Cohen, an analyst at Labe, Simpson & Co., "I expect that the [many] computer companies that are involved in partnerships with Japanese and other foreign investors — some of them, in fact, with Kubota — will simply take this in stride."

According to Sanders, he and Michels, who are suing Kubota in their capacities as minority shareholders of Stardent and as former Ardent shareholders, are not implying that either Stardent or Poduska were complicit in Kubota's alleged actions.

"Don't interpret that there is a split within the company," said Sanders. He said the allegations were brought to the attention of the Stardent board of directors, which, he said, is currently conducting its own investigation.

Not all people close to the parties subscribed to the image of veteran industry entrepreneur Michels and his colleagues as injured innocents. "Allen [Michels] went into this with his eyes wide open, so what's he trying to pull?" asked a source close to the former Ardent, who asked not to be identified.

"He went aggressively after Kubota money. When someone puts a lot of money into your company, they get a lot of control."

Sears puts foot down, insists on EDI ability

BY MICHAEL FITZGERALD
CW STAFF

"EDI will become a requirement for doing business with Sears."

That was the mandate delivered by Michael Bozic, chairman and chief executive officer of the Sears Merchandise Group, in a July 5 letter to all of the firm's estimated 5,000 suppliers that are not currently practicing electronic data interchange (EDI) with Sears.

Bozic said that parent company Sears, Roebuck and Co. expects all of its suppliers to be online by July 1992.

A four-page implementation plan accompanied Bozic's letter. Sears plans to have suppliers come on-line in stages, beginning in January 1991. Each stage will be given 90 days to implement EDI capabilities.

Sears said it will provide software worth some $3,300, along with free training. The plan is being offered in conjunction with Sears subsidiary Sears Communications Co., but suppliers will be able to link up with Sears through any system they choose.

Sears' Dailey *leads firm's EDI charge*

"We will spend $5 million over the full implementation period," said Lance Dailey, EDI project manager at Sears. Dailey has 12 people on his staff and said Sears Communications will provide 12 to 15 of its staff for implementation purposes. Dailey added that Sears expects to recoup its investment within three years.

Bozic's declaration ruffled few feathers in the supplier community. In fact, Sears was praised by every supplier contacted for its even-handed approach, which differs greatly from that of competitors such as K Mart Corp. [CW, July 9].

"K Mart is ramming it down our throats, and they want it basically overnight," said one source, who asked not to be identified. "Our experience with Sears has been more positive; they seem to recognize that you don't do this overnight, and they're not ramming all of the costs down our throat." The source said K Mart's plan requires major modifications to his order systems and "they're forcing us to eat the costs."

"To my knowledge there hasn't been anybody who has complained" about the K Mart requirements, responded Gary Sweetapple, senior director of corporate systems development at K Mart. He said he was very surprised to hear there was any resentment among suppliers.

Brad Gaylord, manufacturing systems coordinator at Norgren Co., said Sears "is taking a good approach." Norgren, a subsidiary of UK-based International Metal Industries that has plants in Littleton, Colo., and Rockford, Ill., manufactures compressed air accessories. "There's not a single deadline; they're offering help through free software and free training . . . I think it's reasonable."

"I'd say Sears is meeting us more than halfway," agreed Robert Hille, director of MIS at Northvale, N.J.-based MEM Company, Inc., a supplier of men's and women's toiletries. "I had a favorable reaction, especially compared with our other customers, like Toys 'R Us, which said they're going to charge us $25 for every piece of paper they have to process, or all those firms that say we have to be up by such-and-such a date."

The biggest concern expressed by suppliers was how Sears would handle implementation schedules. Dailey confirmed that the retailer was still in the planning stages and had no schedule to offer the suppliers.

An easier way

Nearly all of the auto industry's estimated 20,000 suppliers use some level of electronic data interchange (EDI) with their customers, according to John C. Martin, managing director of the Automotive Industry Action Group (AIAG) in Southfield, Mich. So, their customers — the Big Three auto makers, truck manufacturers and off-road vehicle manufacturers — have agreed to try to make life easier for them.

A group of 28 AIAG member companies have agreed to make the necessary compromises to standardize oft-used EDI transaction sets in their industry. The move is expected to nearly eliminate the need for suppliers to bear the cost of maintaining several different EDI computer systems to meet the varied needs of their customers. The AIAG said it expects to have published implementation guidelines with 17 high-usage transaction sets by the end of the year.

CA stock takes 40% plunge after firm says revenue is off

BY JOHANNA AMBROSIO
CW STAFF

GARDEN CITY, N.Y. — Computer Associates International, Inc.'s stock dropped nearly 40% last Thursday, but users should not feel any fallout soon.

The firm's stock plunged from 16½ Thursday to 9⅞ at Friday's close after CA announced that revenue for the first quarter ended June 30 will be "significantly less" than the revenue for last year's first quarter. CA will not release specific revenue and earnings figures until July 24, a spokesman said.

CA said that product development plans will not be affected, however. "This quarterly result will not affect how we run our business," said Bryan Shepherd, executive vice-president of marketing. "CA '90s and our product development plans are still on track." CA '90s is the company's strategy for integrating its diverse product line.

In a teleconference with Wall Street analysts on Thursday, Anthony Wang, CA's president, attributed the lower revenue to several factors, including the longer sales cycle and higher prices for database products than for their usual systems software products. Also, CA salesmen spent a lot of time during the quarter explaining the CA '90s concept, Wang said.

Wall Street analysts did not buy that explanation. "I don't think salesmen are irrational enough to do something that's not revenue-generating," said Rick Sherlund, vice-president of investment research at Goldman Sachs & Co. in New York.

What is really happening, said Andrew C. Brousseau, vice-president of research at Cowen & Co. in Boston, is "their product line is largely focused on the mainframe systems market, and that's growing in the single-digit range."

Wall Street's reaction did not sit well with CA. "Wall Street requires a quarterly accounting, and we're focused more on the long term," Shepherd responded. "It's not reality to suggest that our company is worth 40% less today than it was yesterday. And we're not just in the mainframe world; multiplatform solutions is what CA '90s is all about."

Some analysts remained bullish on CA's longer term prospects. "They have the largest customer base and the largest product line of any software company in the industry," said Scott Smith, vice-president of Donaldson, Lufkin & Jenrette in New York. "Those are great assets. It will take some time, but things will improve."

Multivendor net slated for fall

BY ELISABETH HORWITT
CW STAFF

BOSTON — Digital Equipment Corp. stirred some users' hearts last week by promising a commercially usable multivendor network management system by November. To some, however, the most exciting features of the system are the ones slated for next year and beyond.

Decmcc Director for the VMS family of software, the vendor's first commercial implementation of its Enterprise Management Architecture (EMA), will be bundled with all Decnet VAX licenses beginning in November, DEC said. Included in the package or offered as options will be all the basic network management functions, DEC said, including the ability to collect alerts and alarms, control device parameters and analyze network performance.

Version 1.1 of Decmcc Director, which ships in February, will include a graphics-based, mouse-driven user interface.

In addition to managing DEC's own Decnet Phase IV and Phase V systems, bridges and routers, the initial release will be able to manage anything that complies with the Simple Network Management Protocol (SNMP) for managing Transmission Control Protocol/Internet Protocol networks, DEC said.

However, DEC's initial implementation of Open Systems Interconnect (OSI) network management protocols in Director diverges from the International Standards Organization's specifications, according to DEC product marketing manager Anthony Viola. As a result, some "minor modifications" may be necessary for Decmcc Director to manage OSI-compliant devices, he added. "Right now, there is little demand" for OSI as the basis for multivendor network management, Viola said.

Not all users agreed with the statement. "The OSI support will be helpful because it means we're not locked into any one vendor," and it also eliminates the need to have a different management product for each type of networking equipment, said Price Braddock, a telecommunications analyst at Hardee's Food Systems, Inc. Braddock also praised DEC's support of SNMP and Ethernet standards.

What seemed most exciting to users, however, was Microsoft Corp.'s announcement that it will deliver by early next year an access module that will allow Decmcc Director to manage Microsoft's LAN Manager. The product, for which no shipment date was given, "is fantastic," said John Payne, an analyst at Charles Schwab & Co. "The biggest hole in integrated network management architecture products is their inability to manage [local-area networks]."

In addition, DEC and Apple Computer, Inc. announced a joint project to develop a module that will allow Decmcc Director to manage Appletalk networks. Schwab is also interested in DEC's plans to migrate EMA to a true distributed processing environment, Payne said. "You, the end user, then get to choose what platforms [different components of] the system run on, instead of getting stuck on a $15 million mainframe."

Decworld '90 *promises of mulitvendor network management*

DEC also announced packages for converting existing Decnet systems and earlier Decnet management tools to the new platform.

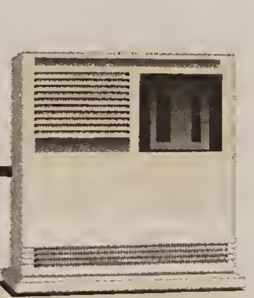
DEC is scheduled to introduce an Ultrix version of Decmcc Director by the end of next year and a Microsoft OS/2 version at an undisclosed date, Viola said.

Senior writer Joanie M. Wexler contributed to this report.

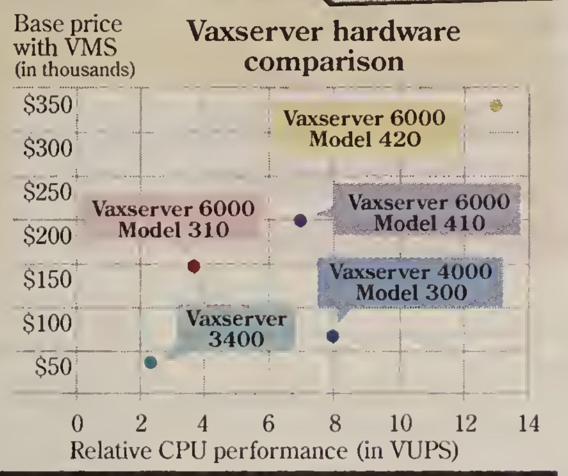
And, of course, products

DEC announced the following products and services at Decworld '90 last week:

- The VAX 4000 Model 300 is a replacement VAX for the Microvax 3900 that is optimized as a network server with up to 1,600 I/O requests per second. Prices for four different configurations range from $75,410 to $233,000.
- Vaxserver Base Platforms are newly packaged server platforms in the 4000 and 6000 lines, especially configured for dedicated file, print, application and compute services for personal computers and workstations. The servers, priced at 20% to 40% less than time-sharing systems, support desktop systems running MS-DOS, OS/2, Apple Macintosh, Unix and VMS operating systems. The servers come bundled with VMS licenses, DEC's RDB database and Decnet software.
- Specialized servers are systems earmarked for database access, multivendor electronic mail networks, messaging and office functions such as document processing. Prices range from $31,500 to $43,000.
- VAX Vector Compute Server is for large, numerically intensive applications. The price is $443,300.
- Decconcentrator 500, which is said to attach DEC workstations, systems or bridges to a 100M bit/sec. Fiber Distributed Data Interface (FDDI) backbone. Priced at $15,000, the concentrator is available now.
- A bridge that is said to link Ethernet networks to FDDI backbones.
- Decelms software, which is said to manage both 802.3 Ethernet and FDDI networks. The software package is priced at $1,800.
- A program to provide an FDDI adapter for VAX 6000s and 9000s. It is slated for release next year.



Announcing...
DEC's new Vaxservers



CW Chart: Paul Mock

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DEC

CONTINUED FROM PAGE 1

Lawrence Livermore National Laboratories in Livermore, Calif. "It will not be a case of Suns and DECs staring at each other and not talking, although there may be a few rough spots."

DEC's architectural umbrella, Network Application Support (NAS), is a collection of DEC software products and services — 14 of them shipping now — that permit multivendor network integration and resource-sharing for database access, file and print services, for example.

Invited to this network party are the operating systems MS-DOS, IBM's OS/2, Apple Computer, Inc.'s Macintosh, Unix and DEC's own VAX/VMS and Ultrix.

The different user interfaces are one obvious stumbling block, users said, noting that Sun intends to keep its Open Look interface while OSF supports Motif. Yet in several areas where DEC and Sun are incompatible, each company and some third-party vendors already offer specific products enabling them to interoperate, Oberman said.

Sam Moore, a systems programmer at North Carolina State University's computing center, is using half a dozen Sun 380 workstations, as many Vaxstation 2100s and 3100s and a host of other DEC machines on a campuswide network.

"If DEC is using things now in OSF that are not in other standard Unix versions, that could cut out a lot of people," Moore said. "But if they come up with something really good, developers will port to the different platforms, and it won't be that big of a deal."

Overall, users at Decworld seemed acutely interested in the NAS strategy.

"Our requirements span a lot of what NAS is offering," said Edward Yodis, chief architect for the NASA Software Support Environment project in Houston, which uses DEC and IBM host machines for engineering workstations from IBM, Apple and Hewlett-Packard Co.'s Apollo division. "We need portability and applications communicating on a network. We'd like to be able to share project management and design information between the different platforms."

Clayton Foster, a senior consultant at Du Pont Co. in Newark, Del., said he will remain skeptical until he sees the NAS promises actually at work. "I expected to hear that it would require a lot of new investment and throwing stuff away," he noted.

However, DEC officials repeatedly assured users that the core idea behind NAS is integration of existing systems into a more productive, multivendor computing environment.

"Vendor-neutral is important to us. We want to be nonproprietary," said J. P. Johnson, manager of scientific systems at Texaco, Inc.'s exploration and production division in Houston. His shop includes a diverse collection of computer systems already in the client/server mode, with a Cray Research, Inc. XMP 216 as the main engine for workstations from Sun, DEC and IBM.

"I got the impression that when DEC says open, it means everybody," he added. "I hope that's true."

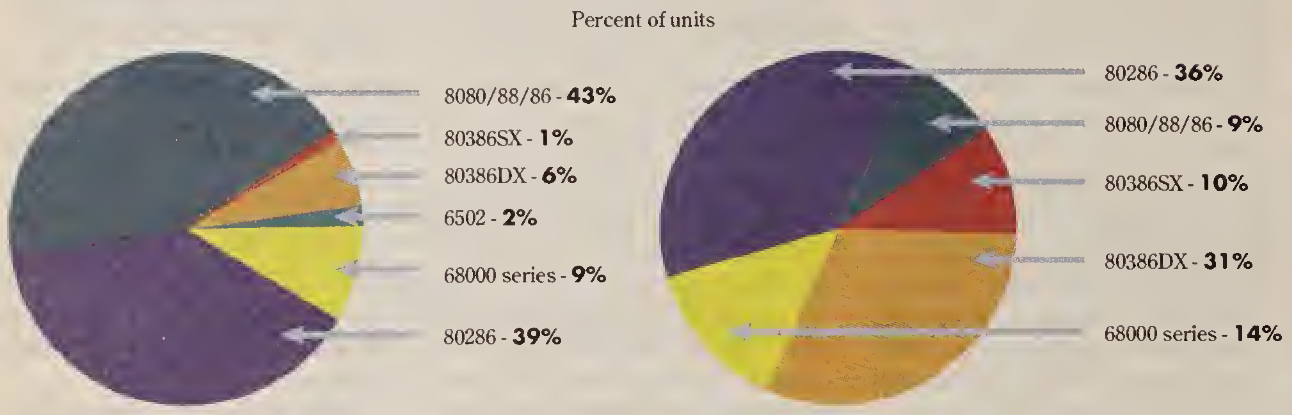
TRENDS

High-performance vs. Low-performance PCs

Despite achievements in processor speed, storage potential and display capabilities, procurements of high-performance personal computers have been less than overwhelming

PCs by processor type

Fewer than 7% of the PCs installed today are based on Intel's 80386 or I486 processors. However, buying plans for the coming year indicate that 386 machines will be purchased more than any other (I486-based PCs accounted for less than 1% in each chart)



Installed*
Total of 4,651,435 PCs

12-month purchase plans**
Total of 288,508 PCs

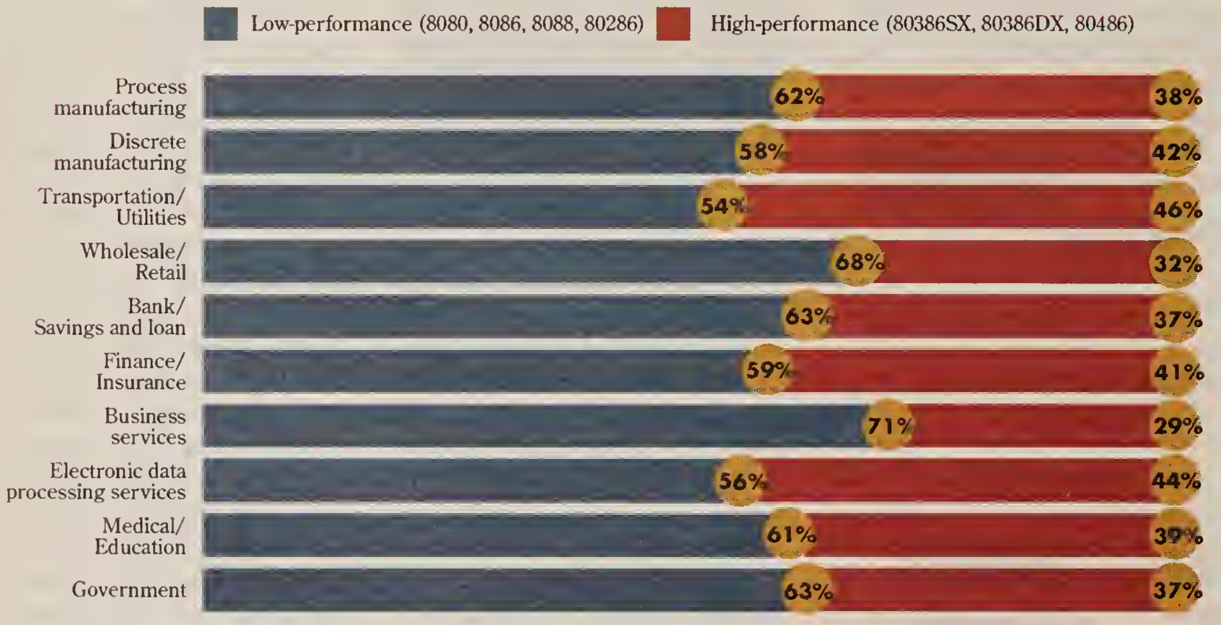
*Installed figures based on a survey of 89,000 U.S. sites

**Purchase plans based on 14,000 U.S. sites

Planned PCs by industry

Although purchase plans of high- and low-performance PCs vary from industry to industry, common to all is that the majority of PCs that are bought will be low-performance models

Percent of sites
(Total of 14,000 U.S. sites)



Source: Computer Intelligence, La Jolla, Calif.

CW Chart: Tom Monahan

NEXT WEEK

"There's something about working here that gives me a special feeling," says **Lloyd Erickson**, an IS manager at the Johnson Space Center in Houston. Erickson is in charge of the Johnson Space Center Management Information Systems, a common interface for users to access multiple databases seamlessly. See Manager's Journal.

Najlah Feanny/SABA

Life at the elevation where strategic plans are made is no day at the beach. Just ask Joseph Brophy, once top IS executive at The Travelers Corp. and now president of The Travelers Insurance Co. He's barely had time to blow a note on his bagpipes since that first big promotion. For the inside story, turn to Executive Report.

INSIDE LINES

Moscow in the chips

Cypress Semiconductor chief T.J. Rogers, who is in the USSR pursuing joint ventures with indigenous chip makers, is faxing in a daily diary to a San Francisco newspaper. In the missives, we find that Soviet chip makers are impressed with the gadgets Rogers has brought them — most of which are made in Japan. Rogers has also engraved on prototype chips a tiny image of a Soviet flag and American flag linked by an integrated circuit.

Reshuffling the deck?

Deere Tech Services said rumors that it was scaling back its computer-integrated manufacturing business were completely wrong. Instead, the company is holding conversations with current marketing partner IBM, as well as with several other companies, to explore new combinations or new efforts that would gain the company more business outside of parent John Deere Co., which provides some 80% of Deere Tech's business. An official at Deere Tech said the parent company was giving it even more work than usual, giving the appearance that resources were shrinking.

Netware woes

The Computer Emergency Response Team, which tracks viruses out of the Software Engineering Institute at Carnegie Mellon University, issued an alert last Friday about a strain of the Jerusalem virus that infects Novell local-area networks running Netware 2.15C regardless of Novell file protections. The virus has hit at least one Netware user site, CERT said.

Rival to John Wayne International

He may not have made Sematech fly, but the late Robert Noyce may be commemorated with an airport. A group of Intel employees are trying to rename San Jose International Airport as Noyce International. It's reported he was infatuated with flying.

Perfect vision

Access Technology, Inc., a Natick, Mass.-based applications software vendor, is expected to introduce a new product called 20/20 Gold. The software, due out next week, is designed for use on DEC VAX/VMS-based machines and is expected to include 20/20, a data processing connection, a word processing connection, DEC All-In-1 integration and Access Openlink software. The big news is that it will all be bundled together at a 40% discount off the combined price of the individual products.

Still in the game

Covering its bets in the host-based networking management race, NCR Comten is expected to introduce today an interface between its network management product and Systems Center's Net/Master. The NCR Corp. subsidiary already has an interface between its Comten Support Facility and IBM's Netview, the dominant system for host-based network management.

Copywrite craft

Borland went on the offensive last week, peppering the media with a new ad campaign designed to counter Lotus Development's charges of copyright infringement. It noted that "according to Lotus' technical support, you cannot view a graph while in perspective mode in 1-2-3." Quattro Pro users can. Claiming that more than 300,000 users have switched to Quattro Pro, the ad copy goes on to note that "At Borland, we believe in software craftsmanship and are fighting for your access to real innovation."

With NASA seemingly intent on fumbling away budget support, defense contractors hoping for space station riches may need to turn to more mundane products. On the other side of the defunct Cold War, according to reports from Moscow, a nuclear missile design center was refitted to develop washing machines. Its first product was delivered recently — with 48 cycles. News Editor Pete Bartolik weekly cycles through the dregs of the industry to bring you these gems, and you can help brighten up his load by throwing dirty laundry at him. Call (800) 343-6474, fax to (508) 875-8931 or message COMPUTERWORLD via MCI Mail.

Due to a software error at the credit card company, the power lunch is now in hot water

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